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# MANAGEMENT REVIEW

AUGUST 1961



## TRY SUING A COMPUTER!

—LEGAL TANGLES IN EDP

Meeting Today's Demands For Product Reliability

Making Decisions—And Making Them Stick

AMERICAN MANAGEMENT ASSOCIATION

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## IN THIS ISSUE



- **Go Sue a Computer.** Executives thinking about installing electronic data-processing—and even those who have installations already in operation—may not be aware of the many areas in which a computer can involve them in tangles with the law. Pointing out that a computer can't be sued, but its owner, its programmer, or its manufacturer may be, this month's opening article examines the wide range of legal problems that are cropping up as business operations become increasingly mechanized—problems from which no company is immune, since they can affect the firm that does not use EDP as well as the one that does.
- **Product Reliability.** Ever since the wonderful one-horse shay, manufacturers have been striving to make products that can be depended on to do the job they were designed for, and the increasing demands on today's complex products make this problem even more pressing. Aimed at the manager rather than the technician, Dorian Shainin's article on page 26 describes a new and important approach to developing an efficient product-reliability program.
- **Yes, No, or Maybe.** The hard-driving, dynamic executive who snaps out spur-of-the-moment decisions with infallible intuition may make good copy in novels, but not every executive can—or should—emulate his methods. Joseph Cooper's article on page 44 discusses the decision-making process and outlines some effective ways of translating decisions into action.

— *The Editors*

AUGUST 1961

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# MANAGEMENT REVIEW

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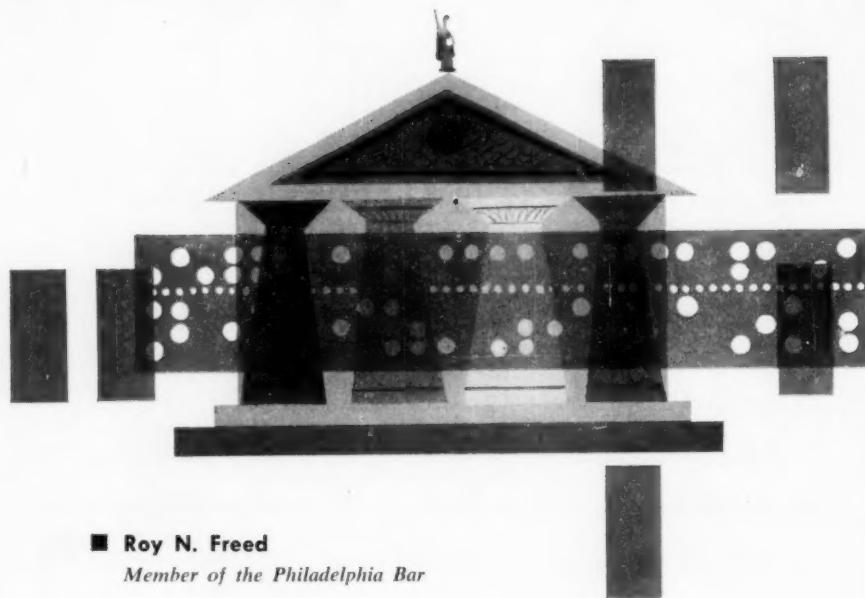
MANAGEMENT REVIEW is published monthly by the American Management Association, Inc., at 1 Sherman Avenue, Jersey City 7, N. J. Main offices at 1515 Broadway, Times Square, New York 36, N. Y. Form 3579 should be sent to 1515 Broadway, Times Square, New York 36, N. Y. Second class postage paid at Jersey City, N. J. Subscriptions: \$7.50 per year (nonmembers, \$12.50). Single copies: \$1.00 (nonmembers, \$1.25). Volume 50, No. 8, August, 1961.

Changes of address should be forwarded to the publishers *six weeks in advance*, and postal zone numbers should be included in all addresses.

The American Management Association does not stand sponsor for views expressed by authors in articles issued in or as its publications.

An index to MANAGEMENT REVIEW is published annually with the December issue. The contents are also indexed in the Industrial Arts Index through December, 1957, and from January, 1958, in the Business Periodicals Index. MANAGEMENT REVIEW is microfilmed by University Microfilms, Ann Arbor, Mich.

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■ **Roy N. Freed**

*Member of the Philadelphia Bar*

## Try Suing a Computer!

### LEGAL TANGLES IN EDP

• An engineering firm uses a computer to make calculations for a bridge it is constructing. The calculations turn out to be incorrect; the bridge collapses, and a lawsuit results. Is the engineering firm guilty of negligence, or is the company that produced the computer liable?

• A computer-operated integrated management system, which was programed by a firm of consultants, incorrectly accepts and ships a large order of special merchandise for a customer whose credit is bad. Who must stand the loss—the company or the consulting firm?

A MANAGEMENT REVIEW SPECIAL FEATURE

• A railroad company utilizes a computer in connection with a device for inspecting railroad cars for hotboxes, thus making it possible to obtain a relatively complete record of cars that need service. Later, a hotbox condition is the cause of a derailment. Even if specific recorded reports of hazards warranting correction have not been created, does the company's failure to utilize an almost infallible inspection system constitute negligence?

• Most of the companies in a particular industry have adopted computers to perform significant operations. Is the company that does *not* use a computer and suffers a loss of its competitive position open to a stockholders' suit on the ground of mismanagement?

#### **Prospective Trouble Spots**

As the use of computers becomes increasingly prevalent in business and industry, such questions as these are bound to occur with greater frequency. Of course, not all legal problems arising from computer use will have dramatic or far-reaching implications; many of the difficulties will concern traditional problems that are merely aggravated or complicated by the presence of a computer. It is important, however, for every company inaugurating or conducting computer opera-

tions to be aware of the many areas in which computers can become involved with the law—and to take steps to anticipate and eliminate prospective trouble spots.

Because every specific situation involves different facts and particulars, each company should obtain competent legal advice—and the earlier, the better. The legal problems that arise from the use of electronic data processing begin when a computer is purchased or leased, and a lawyer who is intimately acquainted with the actual situation of the particular company will be in a position to recognize an array of legal questions that should be answered as the planning progresses.

#### **Buying or Leasing**

In acquiring a computer, either by sale or lease, it is essential to spell out in the formal papers the exact terms and conditions. Computers are extremely expensive gadgets, and they are utilized for very important operations. The legal documents must set forth precisely what the machine is supposed to do for you—and how it will be determined, in the event of a dispute, whether or not the machine has come up to the specifications. This precaution should be taken very seriously, even where standard computers are being acquired. Too

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Mr. Freed, who is associated with the law firm of Ballard, Spahr, Andrews & Ingersoll, was recently general chairman of a three-day forum on the legal implications of computer use sponsored by the Joint Committee on Continuing Legal Education of the American Law Institute and the American Bar Association.

much is at stake to rely on the oral assurances of enthusiastic salesmen.

#### **Machine Maintenance**

If the manufacturer is to provide machine maintenance, close attention should be given to the promptness with which it must respond in case of a breakdown. When a group of people are performing an operation, complete cessation of work is possible only in the event of a strike or a major catastrophe. If a machine is substituted, however, a breakdown can halt the entire operation. How promptly must the maintenance men show up? What will be the responsibility of their company if they are tardy without good excuse? Will the service company have to pay damages? If so, how will they be measured? Face these questions early, and see how far the answers can be spelled out.

Perhaps you plan to secure maintenance service outside. Will your labor contract permit that, or will it be considered forbidden subcontracting? If you cannot contract with others for this purpose, are you prepared to set up your own maintenance crew for such a highly specialized task, and how much lead time do you need to educate them?

On the other hand, your company may plan to do its own computer maintenance. What standards or conditions may the lessor of the machine establish for the level of maintenance to be done by you?

May the lease specify where you will buy repair parts? If you are buying the computer outright, will you be able to secure repair parts from the manufacturer promptly? Are there any special assurances in that regard that you might want to include in the contract with the manufacturer?

#### **Patent Rights**

If you are buying a specially designed computer, are you entitled to patent rights that may result from the development work? This will depend, as a practical matter, largely on the extent to which you are paying for the development costs, either in cash or by the services of your own personnel, and on whether or not the machine will be made only for you and not for anyone else. If you expect to get any patent rights, cover that matter early in the negotiations and put it in the written contract.

Generally speaking, your company may insist on the exclusive use of any machine it has developed at its expense, but there may be special circumstances in which an agreement to this effect with the manufacturer might violate the anti-trust laws, and this possibility should be explored.

#### **Buying Time**

When your company plans to utilize someone else's computer, either indefinitely or merely until its volume of use justifies acquisition

of a machine, a number of legal considerations arise. You will want to protect the confidentiality and physical security of your records, and you probably will object to the use of your program by anyone else. Contract provisions should impose these obligations and specify how damages for their breach will be fixed.

Will the labor agreement of the company renting out its machine permit your personnel to run the computer on your work? If not, your costs may be increased, and you should know this as soon as possible.

On the other hand, if the company providing the computer will create your input tapes or cards, what will be its liability for errors made in the process? Again, the way damages will be determined should be spelled out carefully in the contract.

Can you obtain a guarantee that the company will keep its computer in running order to avoid interruptions in your operations? Should you make arrangements with other computer users for emergency service, just to be certain?

#### **Selling Time**

If your company will not be able to keep its computer running full time, it may want to sell time on it

to outsiders. In this case, the shoe is on the other foot. For example, will your labor agreement permit the personnel of the other company

to come on your premises and run one of your machines? What obligations are you willing to assume to keep your computer running to avoid interruptions to your customers' operations? If the personnel of the customer will come to your plant during second or third shifts, are any special steps required for their safety? Be sure to check on your possible legal liability in this regard.

Consideration should be given to your obligation to protect the tapes of your customers. Not only must you assure confidentiality, but you must also guard them against damage from temperature and humidity extremes, as well as the ultimate danger of fire. Spell out the extent of your obligation to pay damages, and cover yourself with insurance, if possible, to protect against what-ever contingencies may arise.

#### **Paperwork Changes**

At least for a while, it may not be possible to achieve the maximum reduction of paperwork when a computer is installed; paper records must be retained for various purposes. For example, traditional



paper or visual records might be necessary to satisfy specific statutes or official regulations in certain fields of business or industry. Papers that could be produced directly from a computer system might still have to be prepared on special forms. It is entirely possible that where any of these anachronistic difficulties occur, steps can be taken to secure reforms to permit the efficient use of the new technology.

Reluctance on the part of the courts to accept computer records or output as legal evidence in trials may make it necessary to keep written records for that purpose. This aspect should be watched continuously, because a substantial revolution can be expected as computer evidence becomes more commonplace, and you can then eliminate a great deal of paper work.

#### ***Let's Look at the Record***

Record-retention policies should be reviewed in the light of a change to computer use. If you have been disposing of records promptly when official requirements, including those of the tax collector, and the applicable statutes of limitations are satisfied, you now might be tempted to hold on to them longer because computer tapes take up less space. Such a change should be approached with care, however, since in some situations—such as in antitrust litigation—superannuated records that might have to be pored over prove more of a handicap than a boon.

Where "in-line" or "real-time" accounting is conducted by computer, other problems arise. In its normal functioning, this type of accounting continuously up-dates your accounts by altering the records, leaving no trace of the prior facts. It may be necessary to create records specifically to serve as legal evidence in the event of a need to sue customers or defend suits brought by suppliers. If you rely solely on basic documents, like invoice records and payment checks, it may be difficult to reconstruct series of transactions with specific customers.

Moreover, the elimination of many types of traditional records may be considered to deprive stockholders of their right to inspect the records of their company.

A similar problem concerns the new forms to be used in and produced by the computer process. Will output forms satisfy all applicable legal requirements for contracts and negotiable instruments? As machines increasingly are assigned tasks like writing checks, placing orders, and issuing acknowledgments, this matter of the validity of forms must be watched closely.

#### ***When the Computer Breaks Down***

In many applications, continuous computer functioning is essential. Various arrangements are possible to minimize the impact of inevitable breakdowns. In some areas, computer users enter into mutual-assist-

ance pacts with others using the same type of machine, to assure each other of available machine-time in the event of a breakdown. Charges for emergency machine use are handled in a variety of ways: Sometimes there is no charge for a specified amount of machine-time, but the assisted company must supply its own personnel; in other cases, all machine-time is charged for at a specified rate. The written agreement should indicate the work shifts during which the distressed company may expect help and the maximum daily or weekly time that will be available.

A similar insurance arrangement might be made with a commercial or institutional service center. If reasonable continuing payments are made, like insurance premiums, there may be more assurance that machine-time will be available when needed. In fact, such payments may provide the basis for court assistance in the event of an unwarranted refusal of help.

#### **To Err Is Mechanical**

Legal problems can also arise if the computer makes errors. Normally, machines are designed to avoid or at least minimize processing errors—by using parallel circuits, for example, to do each operation twice and compare the results. However, if there is any chance of machine errors that might hurt outsiders (as distinguished from input defects and other human failings of

your own personnel), state in the purchase contract or lease what duty the manufacturer has to defend any law suit and to pay for all or part of the damages. Facing up to this problem will at least alert you to your own risks, which should be covered by liability insurance.

#### **Damage and Injury**

The possibility of machine errors that might harm outsiders raises the question of your company's potential legal liability for injury or property damage. The company's lawyer should examine the entire process to be automated, and he should re-examine it periodically after it is in operation. This check should include the possibility of both machine and human errors that might be avoided with reasonable foresight, and it should carefully determine whether any essential precautionary operations that would affect legal liability have been omitted.

The program for your machine is worked up in advance as a projection of your company's decisions in a wide variety of anticipated situations. Once the computer is put into operation, the correctness of the program must be checked repeatedly in the light of altered conditions, and necessary changes must be made in it promptly.

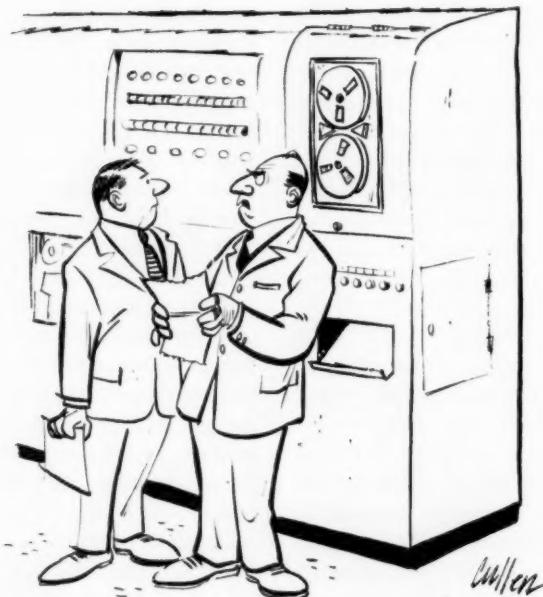
Legal liability is probably less likely to arise when computers are used in business applications than when they are used to control factory operations. However, manage-

ment should guard as carefully as possible against the risks that do exist. For example, can machine-created purchase orders or acknowledgments of incoming orders get out in error, setting up undesired contractual obligations? Could an erroneous default by you on a secured debt, as a result of the computer system's failure to make a

payment on time, put a mortgage holder in a position to accelerate the entire debt?

#### **Sins of Omission**

As the use of computers becomes increasingly common, legal factors may have as much influence as economic factors on a company's decision to install a computer. In



*"If it writes 'To err is human' once more, I'm going to cut off its electricity."*

many cases, failure to follow the example of others and adopt a computer may expose a corporation to legal liability, because it will constitute a breach of the obligation to exercise reasonable care.

Consider, for example, the case of a railroad that has followed a trend to single-track operation, to minimize both local property taxes and the cost of maintaining its right-of-way. Although the problems of scheduling trains moving in opposite directions are obviously greater in single-track operation, the company retains manual train switching and signaling long after others have delegated that duty to computers. In the event of a wreck that a sophisticated computer, but not a person, could have avoided, the railroad might find itself liable because of its failure to keep pace with technology. The situation is analogous to the failure of a ship operator to utilize radar after it has been adopted by other lines.

Similarly, an aircraft company might be held liable if it failed to utilize a computer to simulate, in advance of manufacture, the functioning of a complex product like a jet airplane, if unanticipated defects were later to cause an accident. (It is possible, of course, that just the

reverse might occur: Errors in programming or data input could *create* just such a catastrophe, and the company could well be liable if it relied entirely on the computer's "infallibility" and failed to utilize operational test procedures.)

#### **Preventive Law**

It is impossible to conjure up more than a small fraction of the legal problems that could arise from the use of computers. Some might sound far-fetched, but they are quite conceivable. If, for example, an industry-wide standard computer program were worked up for costing, it might, depending, of course, on the elements contained in it, be considered to violate the antitrust laws against price-fixing.

A close look at your operations is essential to uncover these pitfalls and prevent legal trouble before it starts. Once legal entanglements occur, ultimate success is frequently expensive to achieve. As computers are given continually greater tasks in the business world, they become more likely sources of legal trouble. It is a wise move to put the company's lawyer on the computer planning team early and to keep him in touch continually with the operations of this important new device. ♦

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THE FUTURE lies not in the product but in the minds behind it. Nothing we can offer the public has greater excellence than the thought which called it into being.

—Clarence B. Randall



## THE BUSINESS PICTURE: Mixed at Midyear

By Richard Rutter

*Condensed from The New York Times*

AS THIS YEAR moves into its second half, the state of the nation's economy is no cause for dancing in the streets. But neither is there reason for any funeral orations. For at the halfway mark, the year's business picture can best be described as "mixed." There are many signs of resurgent strength in the economy, but at the same time there are some disquieting developments.

### How High Is Up?

The first half of 1961 marked the end of one of the mildest and briefest recessions since World War

II. There is no longer any question about recovery. The big questions now are: How strong and sweeping will be the upturn? Will it turn into a real boom, or will it merely settle down into a moderate comeback, marked by business that is good but not spectacular?

The answers, as offered by experts both in and out of government, also are mixed. Some people, including Secretary of the Treasury Douglas Dillon, think the economy will definitely shatter records by this time next year. Others, more cautious, think a period of gradual growth lies immediately ahead, with

*The New York Times* (July 2, 1961), © 1961 by The New York Times Company.

a real boom two or more years off.

Those with tempered enthusiasm can point to several "soft" spots in the present economy. Not all industries have snapped back with equal force from the lows of the 1960-61 recession. Overcapacity continues to plague some, as evidenced by a recent rash of price cuts in several basic industrial materials. Profits, sharply reduced in the first quarter of 1961, apparently are still being held down by a price-cost squeeze. High unemployment remains an unsolved problem. Competition is keen and getting keener, especially from imports and in world markets.

### **Quick Turnabout**

Yet, despite these problems, the midyear picture is one of a quick turnaround from the recent recession. The extent of the upturn can be measured by the course of industrial production. On the basis of the Federal Reserve Board's index of industrial production (1957 level equals 100), the recession began in May, 1960. The index slid from 110 that month to a low of 102 in the first quarter of 1961. By May, 1961, however, this indicator had climbed back to 108, rising three points within a month. It was only three points below the record high of 111 set in January, 1960. Industrial production may well reach a new high before 1961 is over, because the last quarter is traditionally the longest period of the year for industrial activity.

This May, there were further indications of business recovery. New orders for durable goods amounted to about 14.9 billion dollars, after rising for the fourth consecutive month to the highest level since October, 1959. May orders were more than 15 per cent higher than those received in January, 1961, the recession low.

### **Major Brake**

However, one major brake on the economy has been the curtailment in capital expenditures for plant and equipment. This lag still is causing some concern, as no indication of a sharp upturn has appeared. In the third quarter of 1960, business spending for plant and equipment ran at a rate of 35.9 billion dollars a year. By the first quarter of 1961, outlays had fallen to a rate of slightly under 34 billion dollars a year and held there through the second quarter. Such spending is now expected to rise slightly to a 34.6-billion-dollar rate in the present period and to 35.5 billions by the fourth quarter of this year, according to projections based on a survey by the Securities and Exchange Commission and the Department of Commerce.

Meanwhile, there is considerable evidence that the man in the street is faring better. In May, personal income rose for the third consecutive month, setting a record of 413.7 billion dollars on an annual-rate basis. This presented increases of

2.4 billions over the April rate and 7.5 billions over the recession low of this past February. Factory payrolls swelled by 1.4 billion dollars from April to May and were the largest since August, 1960. They had declined in most of 1960 and early 1961.

As they are making more money, people are spending more. This is showing up in retail sales. On a seasonally adjusted basis, retail volume rose in May to over 18.1 billion dollars—about the highest for the year. There was probably a further increase in June.

### **Three Keys**

As the second half gets rolling, attention is focused on three key industries—steel, automobiles, and construction. It is widely held that as these three giants go in the coming months, so will go the economy. If so, recent signs have been definitely encouraging.

Steel production, for instance, continued around 70 per cent of the mills' capacity in June. During the course of the recession, operations fell to below 50 per cent and in December, 1960, they touched the lowest levels in twenty years. There have been price cuts recently in specialized products, but the big-volume items have not yet been affected. After the usual summer slowdown, the steel industry confidently expects a notable upturn in orders and activity.

The auto industry reached the

halfway mark of the year in a fairly cheerful mood. A late sales report—for the middle ten days of June—showed an increase of 17 per cent over the early June rate. In the second quarter of this year, car sales aggregated over 1.5 million units, according to Ward's *Automotive Reports*, against over 1.2 million cars in the first quarter. The reception of the new models in the fourth quarter should go a long way to determine what kind of a year will be entered in Detroit's record books. Sales of six million cars for the year, considered quite possible by many in the industry, would make 1961 a good auto year.

### **Less Doubt About Construction**

There appears to be less doubt about the construction industry. After a slow start because of unusually severe winter weather and a damp, chilly spring, building activity began to accelerate. It has increased in each month of the second quarter. In June, spending for new construction projects was at a rate of almost 55.7 billion dollars annually—up 9 per cent from the May rate.

Washington observers now expect building outlays this year to reach about 58 billion dollars, for a gain of 4 per cent from the 1960 level. One indication of the future course of construction: Contract awards in June rose by 5 per cent from the May level. Such awards precede actual building by many weeks. ♦

# The Materials Age

By Henry R. Clauser

Condensed from *Harvard Business Review*

**I**N THIS TWENTIETH CENTURY, materials—not just one but many—have become the most important single factor on which the advance of technology depends. Our progress in electronics, in automation, in space flight, and in the use of atomic energy is directly linked to the use of materials. In less glamorous areas, too, there are few industries or plants today where materials are not the key to meeting increasingly severe service conditions, to improving product performance, and to lowering costs.

Thus, the impact of materials is widespread, and progress in most manufacturing companies depends on how well management organizes to meet the challenge of the Materials Age. The Materials Age has three distinguishing characteristics:

- *The tremendous number of available materials.* The number of known plastic and rubber products and ceramic materials has increased

several hundredfold since 1900. Even in the metals field, where the rate of development has been slower, there are at least 20,000 different alloys, and many more are becoming available each year. To these must also be added the combinations of materials—clad metals, reinforced plastics, and laminates, for example—which combine the best properties of two or more materials.

- *The critical role played by materials in industry.* As a result of the recent cornucopia of materials, product manufacturers have found new freedom in design. Rather than design to match the capabilities of familiar materials, many companies now establish optimum product performance, function, and cost, and then seek the materials with the right properties to meet those requirements. This has created a paradox: Engineers' imaginations have produced devices which have

*Harvard Business Review* (May-June, 1961), © 1961 by the President and Fellows of Harvard College.

already outstripped the properties of existing materials. Consequently, the complexity of products plus the competitive market have imposed unprecedented demands on materials.

• *The emergence of a new science of materials.* The aim of this science is to explain the behavior of materials in terms of their structure, which in turn will open the way to a better understanding of what, in a material's internal architecture, determines its strength, its resistance to heat, and its performance under varying conditions. The next step is to design and produce materials that are tailor-made to meet the requirements of specific requirements or applications.

#### ***The Trend to Materials Groups***

These characteristics raise a crucial question for management: How shall industry organize and handle the complicated materials problems of today? One potential answer is developing: the trend to company-wide or centralized materials groups.

What functions do these groups perform? Perhaps their most important duty lies in the selection of materials. These groups not only are involved in the design of new products, but frequently they are also called on to analyze existing designs and suggest materials changes to improve quality or reduce costs.

A second duty is to be aware of materials developments and to eval-

uate them to determine whether or not the company can use them to advantage. When a new material shows promise, it must be tested to obtain design-and-fabrication or processing information. In many cases, new or modified processing procedures must be developed before a material can be released for production.

A third task performed by materials groups is developing materials standards and specifications and compiling lists of approved suppliers. These documents are the major tools of materials engineers, and they are indispensable to those managers who must control the selection, purchase, and processing of materials. When properly prepared by materials groups and administered efficiently by management, such specifications and suppliers lists can lead to significant savings in materials as well as in production costs.

A fourth function of materials groups is collecting, digesting, and distributing materials information to all interested personnel in design, development, manufacturing, and purchasing departments. Thus, materials groups must also be able to translate scientific information into a form that is understandable and useful to general management.

#### ***Material Savings***

The aim of all these functions is to bring to bear a thorough knowledge of materials at all stages of the

planning and manufacturing cycle in order to enable a company to produce high-quality products at the lowest possible cost. For example:

At the Indianapolis plant of the Western Electric Company, where 32 million dollars was spent for materials in 1959, a 1.5 per cent saving in materials costs resulted from the activities of the materials-engineering department. An additional saving of 1 per cent was effected by the joint effort of this department with others in the organization. Moreover, while making these savings, the company found that product quality was improved in many cases.

#### **Research and Development**

These functions are concerned with the *application* of new and existing materials. There is another materials-engineering function of growing importance: that of *developing* new materials and *modifying* existing ones. Some of the materials departments in large companies spend as much as half of their time and budget in materials research-and-development work and in developing new processing techniques. For example, most of the early work on semi-conductor materials for transistors was done by materials specialists at Bell Laboratories and by similar groups throughout the electrical industry. Several jet-engine alloys have been developed by Westinghouse and General Electric. And recently materials groups in

the aerospace field have developed improved sealants and heat-resistant coatings.

#### **Organization**

How can central materials groups best be organized? Since these groups are relatively new, there are no firm rules as to where they best fit on organization charts. In a majority of companies, the materials group functions as a service department under engineering. However, in some firms, the group reports directly to top management. But regardless of where it is located organizationally, a materials-and-process-engineering group usually provides its services to all engineering and operating divisions, including research, manufacturing, maintenance, and purchasing.

A few large plants have materials groups in several of their major departments, such as engineering, research, and manufacturing. Also, some large multi-plant corporations have a materials group in each of their plants or operating divisions as well as a central materials department at the corporate level.

The internal organization of central materials departments is, of course, dictated largely by the nature of each company and its products. Generally, departments are organized into several different materials sections, such as metals, non-metals, and processes. Others are sectionalized by product, by project, or by broad property areas. A few

are organized by functions such as research and development, materials application, and standards and specifications.

The materials laboratory at the Westinghouse Electric Corporation typifies the highly developed materials organizations that are to be found in many giant, multiplant corporations. Here, the materials group is one of three laboratories making up the central research-and-engineering complex at corporation headquarters in Pittsburgh. The director of the materials laboratory reports directly to the vice-president of research. Besides having a central materials department, Westinghouse has in each of its major plants a materials-engineering group to handle the work that is directly related to the plant's products.

The central materials laboratory, employing over 420 people (of whom 45 per cent are technical graduates), devotes its efforts chief-

ly to general problems that concern more than one division. It also deals with problems that the plant materials groups are not equipped to handle. Thus, it evaluates new materials to see how they can be adapted for use in products the company now makes or might make in the future. It develops property data and prepares company specifications. It provides technical assistance on materials problems to design and product engineers. And it solves materials-processing problems and develops new fabricating techniques when needed.

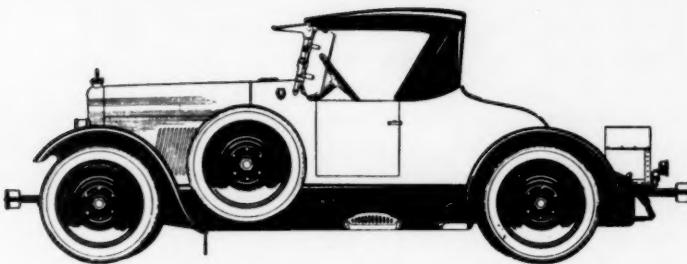
Finally, the central materials laboratory devotes a large portion of its efforts to developing or modifying materials to meet specific product requirements. Often the laboratory carries out pilot plant operations to supply manufacturing divisions with experimental quantities of materials required in developing new products. ♦

### *Down by the Old (Bleep) Mill Stream*

THE MOST EXPENSIVE JUKE BOX in the world may be the one located at General Electric Company's Phoenix, Ariz., plant, reports *Factory*. Actually, the device is a GE 210 computer, used normally at the plant for processing inventory and production schedules.

By translating music notation into computer language, a programmer can feed any song within a four-octave range into the machine. When the computer plays it back (by varying voltages from one level to another), the result sounds like a cross between a clarinet and a pipe organ.

This computer may be the only instrument currently performing "Sweet Adeline" to the accompaniment of blinking lights, spinning tape wheels, and clacking typewriters.



## Do We Need Planned Obsolescence?

*Condensed from Printers' Ink*

**P**LANNED OBSOLESCENCE—the superficial redesign of products for sales motives alone—has become an integral part of the U.S. economy. It has also become a controversial one, with the debate centering on these questions:

- Is planned obsolescence in the best interest of the country?
- Are vital economic, human, and natural resources being wasted by the systematic outdated of product models through superficial style change and other devices of planned obsolescence?
- Does the U.S. economy depend on planned obsolescence for its

prosperity? If it does, is there a substitute?

Most marketing men (about two-thirds of those surveyed by *Printers' Ink*) say that planned obsolescence is contrary to the best interests of the country. A one-third minority, however, argues that it is a "vitally necessary stimulant" for maintaining our private-enterprise system.

Most observers are agreed on one point: Wastefulness is inherent in planned obsolescence. When a product is discarded for style alone, before it has completed its functional life, the man-hours, dollars, and raw materials represented by that unused

*Printers' Ink* (May 26, 1961), © 1961 by *Printers' Ink Publishing Corp.*

portion must be counted as wasted.

This waste, however, has been exaggerated by some of the critics—such as Vance Packard, writing in *The Waste Makers*—many economists argue. In a free economy where full employment has never been achieved during peacetime, any device which produces man-hours of work is not wasteful when it insures an income to those who might otherwise be unable to meet minimal needs.

The waste of dollars, moreover, is relative. There is no finite relationship between the number of dollars spent on washing machines and the amount spent on, say, public schools. The dollars spent on one sector of our economy are not necessarily taken penny for penny from some other sector; fewer washing machines will not necessarily result in more schools. On the contrary, as some economists have argued, the tax revenues on the manufacture and sale of increasing numbers of washing machines may permit the construction of still more schools.

#### **Material Waste**

The charge of material waste has been less successfully countered. Any nation's material resources are limited, and the world limits are now being understood. The depletion of natural resources has long been a matter of serious concern. But as some economists note, the critics have tended to exaggerate the limitations and to minimize man's

inventiveness to satisfy his pressing needs.

#### **Do We Need It?**

The final question is the crucial one: Could—and should—the U.S. get along without planned obsolescence? If so, how?

Many sectors of the U.S. economy obviously would falter if planned obsolescence suddenly were eliminated. The ladies' garment industry, for one, might just as well shut down if women stopped buying the latest styles. Cosmetics, men's fashions, furniture, housewares, and countless other style-conscious industries would be hit, too.

The reasoned critics of planned obsolescence, however, are not speaking of the fashion industries when they issue their indictments. They refer principally to the automobile industry, the appliance makers, and those other durable-goods manufacturers that attempt to foster rapid repeat sales of long-life products by cloaking them in a style that can be successively out-moded by each later model.

Do these manufacturers depend on planned obsolescence for a profitable level of sales? Could individual automakers, for example, maintain model designs over a period of years (as Volkswagen has done) and still sell enough cars to return dividends to their shareholders?

Most of the automobile and appliance manufacturers apparently feel that they (and the entire econ-

omy that depends on these industries) could not prosper without planned obsolescence. Each year they offer consumers a new array of cars, refrigerators, washing machines, dryers, dishwashers, and so on—some of which incorporate significant technological progress, but many of which are merely last year's machines refurbished with a new piece of chrome and a new hue of paint. Clearly, the time lost in model change-over, and even the cost of retooling for minor changes, would militate against planned obsolescence unless these manufacturers felt that consumers supported "newness for newness' sake" sales.

#### **Latent Demand**

Is there a substitute for planned obsolescence? Is there some other device that could keep these vital industries (and the economy as a whole) at full production and full employment without the old device's inherent (if exaggerated) wastefulness and its tendency to facilitate (but not initiate) frequently misdirected consumer goals? Consumers have built up "forty billion dollars of consumer latent need and demand" between 1956 and last January because they have not increased their personal spending as fast as they have increased their productive ability, says Arno H. Johnson, senior economist of J. Walter Thompson. Is there some method more acceptable than planned obsolescence to lead consumers to spend it?

One direct approach to the problem has been suggested by the marketing and advertising officials surveyed by *Printers' Ink*: Cut prices. When asked how this latent purchasing power could be released, 50 per cent cited "lowering of prices," 10 per cent said "expanded use of credit," and only 1 per cent suggested "some form of forced spending (such as a tax on portions of unspent savings)."

#### **Two Other Solutions**

Many respondents had two other solutions to suggest: more and better advertising to stimulate sales, and a better product to sell. A combination of all three suggestions—better products, supported by better advertising, sold at a lower price—probably would work best, though the squeeze on profits might make the combination difficult to achieve.

One point is certain: A solution must be found. The mounting criticism of product styling and product advertising demands that marketing must modify its practices somewhat to conform with a greater social and economic good. Social and economic critics demand this change. Those *Printers' Ink* survey respondents who deplore planned obsolescence recognize the need for a change. Should the status quo continue, legislative restrictions on marketing and a tax on advertising certainly will loom as an ever-menacing threat. ♦

# FOREIGN LICENSING:

## Exports by Proxy

*Condensed from The Wall Street Journal*

**F**OREIGN LICENSING—an effective way to extend operations overseas and bring back profits with a minimum of risk to corporate capital—isn't new. But it's evident that there's been a steep upturn in it recently. And Congressional approval of President Kennedy's proposal to tax the retained earnings of foreign subsidiaries of U.S. companies will accentuate this trend, many foreign-trade analysts believe.

The rate at which licensing agreements were set up in the first quarter of 1961 was 50 per cent higher than in the last half of 1960, according to a recent study of 3000 firms. Royalties to U.S. firms from foreign licensees, at last count in 1959, totaled 515 million dollars, according to the government figures—43 per cent more than in 1956. More than 12,000 licensing arrangements are now in effect, roughly double the number in 1945.

These licensing agreements usually provide that the overseas firm pay an initial license fee and then

royalties ranging up to more than 35 per cent of sales. (The average income on licensing arrangements is probably about 3 per cent to 4 per cent of foreign sales, officials of U.S. firms say.) In return, the U.S. company permits the overseas company to use its patents and brand names and supplies manufacturing and selling know-how. The U.S. concern thus gets its product made overseas without an investment in foreign facilities.

### **Opening Up Markets**

Licensing offers other benefits, too. It often opens up markets abroad for component parts manufactured here, where the licensee is primarily an assembly operation. It's often a first step toward manufacturing abroad for firms that plan to acquire their own overseas plants eventually. Some agreements have cross-licensing clauses providing for the flow of new ideas back to this country. And foreign licensing spreads the money spent on research

*The Wall Street Journal* (June 14, 1961), © 1961 by Dow Jones & Company, Inc.

over a broader sales base, helping trim costs per unit in the U.S.

There are pitfalls, too. It's not uncommon for licensors to find themselves temporarily blocked from collecting the funds coming to them: Foreign governments, when short of foreign exchange, may restrict the conversion of royalties from the local currency into dollars.

U.S. manufacturers have reacted to this problem in various ways: Peter Pan Foundations, Inc. a few years ago couldn't get Finnish marks changed to dollars, so it took payment in printed paper containers which it subsequently used to package American-made products. Executives of another U.S. company use blocked Greek currency to buy air and train tickets when they visit Europe. McGregor-Doniger, Inc., manufacturer of men's and boys' wear, currently can't get royalties out of the Philippines, so it is investing in the stock market there.

The hardest task in licensing is picking the right party to represent you, U.S. firms agree. "You pick the wrong person and a ten-page contract won't help you," says Kurt A. Metzger, vice-president of Maid-enform Brassiere Co., Inc.

#### ***Risking a Reputation***

Another danger, many agree, is the possibility that an unscrupulous licensee will destroy a brand's reputation by marketing an inferior product. One U.S. garment maker recently found himself tied to a for-

ign manufacturer who not only was making a shoddy product but also was restricting its distribution to his own stores. The U.S. company broke the contract and awarded the license to another firm.

Generally speaking, owning and operating a foreign subsidiary is usually more profitable than licensing; direct exports from the U.S. also often provide higher yields. The profits from these operations range as high as 10 per cent of sales or more, more than double the average return on licensed sales overseas.

#### ***Advantages of Licensing***

Nevertheless, the advantages of licensing are converting more and more firms to this type of operation, often in combination with other kinds of export activity. One advantage was amply illustrated last year when Castro seized more than one billion dollars' worth of U.S. property in Cuba. Helene Curtis Industries, Inc., lost only a few thousand dollars in receivables despite the fact that hundreds of thousands of dollars' worth of its products were made annually in a Cuban plant. The company was operating through a licensee so it had no physical assets there.

Licensing helps solve the problem of staffing foreign operations. "We don't have enough bilingual people to operate foreign subsidiaries," says Daniel F. Gerber, president of Gerber Products Co., Fremont, Mich., baby-food manufacturer. So

Gerber is starting foreign production by licensing a Japanese firm to make its strained fruits, vegetables, and meat products. Soon German and French firms will be licensed also, Mr. Gerber says.

Stiffening import restrictions in many countries also are boosting the trend to licensing. Licensing provides a quick way for U.S. firms to begin manufacturing inside a country that jacks up its tariffs or restricts imports in other ways. For this reason, such agreements are increasing rapidly in Argentina, Venezuela, and Mexico, which are trying hard to conserve gold and foreign exchange and promote local industry by putting curbs on imports.

#### ***Interchange of Ideas***

The interchange of ideas through cross-licensing produces many more innovations for U.S. consumers than is generally recognized. Peter Pan Foundations this spring introduced to its U.S. customers a new brassiere with a special synthetic fabric developed by its German licensee. John B. Stetson, the hat maker, is getting styling advice from its British licensee on how to develop "British look" headgear for the American market. Clark Equipment Co., Buchanan, Mich., recently added a new line of fork-lift trucks in the U.S. that were developed in cooperation with licensees in Germany and Belgium. "We also depend on our licensees to keep us

informed of anything new in the field that someone in their area may have developed," says Walter E. Schirmer, Clark vice-president in charge of international operations.

#### ***Selling to Licensees***

Many firms, especially large machine producers like Allis-Chalmers Manufacturing Co., Harnischfeger Corp., and Clark Equipment, do a profitable business in selling components to their foreign licensees. Most of Clark's licensees, for example, buy the transmissions and axles for heavy construction machinery from the U.S. firm. About half the 2.2 million dollars the company took in from its licensees last year came from component sales, Mr. Schirmer says.

Other firms find their licensees will buy products the license-holders need to round out their line. Borg-Warner, for example, licensed a South African company to produce its nine-cubic-foot refrigerators. The licensee purchases other of Borg-Warner's Norge refrigerators to complete its size range. As a consequence, Borg-Warner's exports to South Africa have jumped from 600 refrigerators a year to 3500.

Frequently a U.S. company will accept its royalties from a licensee in the form of an equity in the licensed company instead of cash. "By taking equity instead of cash, we can increase the long-range-earnings potential of our company through sharing in the licensee's

growth without risking any out-of-pocket investment," says Robert Stuart, senior vice-president, National Can Corp. Clark Equipment Co. has gained part ownership, ranging up to 45 per cent of the stock, in eight foreign businesses; all started as licensees.

While a desire to share in future profits is one reason for acquiring a share in ownership, U.S. firms

sometimes do it to insure against future competition. "If for any reason the licensing agreement shouldn't work out, unless you have an equity you've given away all your know-how and set up a competitor," says an executive of an industrial-boiler manufacturing company. "A couple of men on the board give you some control of the operation," he says. ♦

### Trademark Changes: Proceed with Caution

THE RUSH of many leading companies to modernize their trademarks has resulted in a sameness that is destroying the very goal these companies set out to attain. That's the finding of Edmund W. J. Faison, president of Visual Research, Chicago, whose recent speech before the American Marketing Assn. was reported in *Advertising Age*.

Dr. Faison said he objected to trademark "me-tooism" chiefly because it "makes very poor marketing sense. There are already too many products that are hard to distinguish from their competitors', and the trademark similarity adds to the confusion," he said.

Before effecting a change, a company should carefully research its present trademark in order to determine whether or not it properly reflects the company and/or product image. If research shows that the trademark is inappropriate, change or modification is definitely in order, Dr. Faison said, but added that the need for change should be clear-cut. "Remember that many years and many dollars have gone into promoting the old trademark," he said.

Dr. Faison listed three tests that a good trademark must pass: Visibility, memorability, and appropriateness. Each of these factors has many ramifications, he said, listing these among others:

- One color cannot be said to be more visible than others; it is the contrast of colors that makes them visible.
- Simple forms, such as circles and squares, are more easily remembered than complex ones; the inherent danger in simplicity is that the symbols may be remembered but not associated with the company using them.
- Before an appropriate trademark can be designed, the company must decide what qualities it wants to be known for and what image it wishes to evoke.
- Ideally, a trademark should be suitable for use on all company products, in all advertising, on stationery, shipping containers, and delivery trucks, and in all markets, without change.

# MEETING TODAY'S DEMANDS FOR

■ **Dorian Shainin**  
*Vice-President*  
*Rath & Strong, Inc.*

**I**N MANY INDUSTRIES, traditional quality-control measures are no longer adequate to meet the demands for increased product reliability. The most obvious examples of this fact, of course, are the satellite, missile, and unmanned-vehicle programs—in which contractors have been confronted with demands for guarantees of 99.999+ per cent reliability under environmental se-

verities never before experienced—but ramifications of the problem extend into many areas of manufacturing. Tighter inspection by the manufacturing division or closer vendor-acceptance standards in the purchasing department cannot go very far to meet these new needs; the reliability demanded can only be met by a whole new approach that calls for a closely coordinated

**A MANAGEMENT REVIEW SPECIAL FEATURE**

# Product Reliability

attack by research and development, manufacturing, purchasing, quality control, and sales and service. And the stakes are so high that top management simply must get into the act.

Today's severe demands require revolutionary preventive measures. In many situations—with satellites and missiles, for example—the final product is not even available for actual-use testing, or it is impracticable to wait for feedback from field failures or deteriorations in use. The

effective answer in all cases is a systematic program to isolate and eliminate all possible causes of failure *before* they occur—and the goal is a product that has a clearly definable mathematical probability of a specified life under a specified environment.

Although the need for such explicit reliability has been highlighted by defense needs, the lessons learned and the techniques developed should by no means be confined to the "glamorous" applications in a

Minuteman or Explorer or Echo. A reliability program is just as important to the manufacturer of such prosaic items as bearings, pumps, or piston rings.

#### **Attacking the Root Causes**

The end results of a reliability program are expressible in quantitative statistical terms, but the accent should be on what has gone before—on the relentless tracking down and elimination of all identifiable significant causes of failure. The mathematical measure and proof of the reliability finally achieved is only the last step in the process.

It is the campaign to isolate and eliminate the root causes of malfunction that differentiates this approach to reliability from that followed in most companies—even those that have highly competent design and production departments and sophisticated statistical quality controls.

Many companies take the position that they already have a "reliability program." They point to activities in accelerated life testing, to analyses for systems dependability, to stepped-up inspection procedures, and to special designs for high-reliability components. They may even have special teams working with the engineers on reliability analyses for known environments, to make revisions in drawings before going into experimental production. But in most cases, they are still up against the fact that failure rates re-

main high for too long during development programs. This often leads to the assumption that the only recourse is to make some major change in design—sometimes including the provision of redundant components.

At the same time, these companies may find to their chagrin that some of their competitors apparently are more easily meeting specifications and establishing a reputation for reliability. Obviously, the slogan for survival must be: "If others can do it, so can we!"

#### **More than Statistics**

A sound reliability program is more than the use of a set of statistical techniques—it is a whole new way of thinking that involves abandoning some ingrained notions about traditional problem-solving techniques. It is a program that ferrets out the unknown causes of repeated failures and develops the biggest possible return by concentrating on the "vital few" causes that account for most of the trouble. That this approach works is demonstrated by the results achieved in some of the most demanding defense applications, as well as in numerous plants making commercial products.

Obviously, the specific steps taken depend on the stage at which the reliability program is initiated. Where there is as yet only a design, and no prototype or production units, emphasis should be on preventive measures before the larger

problems of testing prototypes and production units are up for consideration. In some cases, such as in the missile programs, it has been possible to test no farther than sub-assemblies. Of course, where the end product is available, one can more efficiently get at the all-important "vital few" causes of breakdown.

#### *In the design stage*

In the concept and early design stages, all the pertinent resources in the organization should be tapped to eliminate potential reliability problems early in design—beginning, if possible, at the initial product concept. Company personnel with experience and skill outside the designer's realm should participate in review meetings at appropriate points in the development of the design. Emphasis should be on providing constructive criticism to be reviewed by the designer, without taking from him any final authorities and responsibilities.

Check lists covering critical points to consider can be developed on the basis of previous failure experience on similar devices. Points of view on manufacturing facilities, inspection and testing, market requirements, maintenance and service, and any other special skills involved should be tapped, and a written form or report should then be prepared, to list the two most likely modes of failure for every component and subassembly.

When design is 80 to 90 per cent complete, a final design-review meeting should be held with engineers responsible for design, again bringing in the type of talent mentioned above.

#### *In the hardware stage*

Even the best engineer cannot think of everything. When the hardware stage has been reached, it is necessary to bring out causes for unreliability that may not have been considered important, or may not have been thought of at all. It is at this stage that the reliability team can work with experimental units, the earliest production units, a group of subsequent early production units, and finally units in the field, from which feedback information is obtained.

It is important to note that in this stage you are not yet ready to determine achieved reliability "measures." You are still in the all-important process of forcing failures and malfunctions in order to identify and control all their significant causes.

#### *Removing the Instability*

It is at this point that the program here envisioned departs most radically from traditional approaches. In the first place, it takes the position that only after substantially all possible controllable causes of failure have been mastered is there any point in discussing failure rates and reliability measures. Many ex-

trapulations from failure-rate data that purportedly validate reliability for specified confidence levels are questionable, since failure rate is assumed to be constant when, in fact, measures have not been taken to assure constant failure rate.

Unless steps along these lines are taken, companies will find that so-called reliability just doesn't stay put; under use, reliability will change from unit to unit, from time to time, for different environments, and the like. This program removes that instability by eliminating, one by one, the causes of departure from a constant failure rate—then lowering the remaining constant failure-rate component.

The more obvious factors leading to product failure will be discovered and dealt with in the ordinary course of good developmental work. The ones that cause the nagging difficulties are the *unknowns* of the product and environment. It is these that the reliability program must dig out, and it is here that the virtue of controlled experiments manifests itself. Experiments must be designed "to make the data speak." Intuition alone won't work—if it did, reliability would not be the high-priority problem it is!

#### **Variation: The Clue to the Causes**

The major guide to the location of unsuspected causes is *variation analysis*. This approach leads to the answers by a process of elimination, because of the "maldistribution"

principle that is operative in almost every cause-and-effect situation. This principle asserts that although every effect has one or more causes, in almost all cases it will be found that only a few causes control or predominate. Furthermore, causes always vary in intensity, so the corresponding variation in an effect can be considered an output of the related causes. Thus, analyzing the variations in effects by appropriate statistical techniques will uncover the causes.

#### **The "20-Questions" Approach**

Under this procedure, no time is expended unnecessarily in speculating on what might have caused an observed failure or malfunction. Instead, variations in strength and performance are allowed—encouraged, if necessary—to show themselves. These can then be separated quantitatively into *components of variation*, which are further analyzed to permit targeting in on the final causes that must be eliminated or controlled. Such analysis permits a surprisingly rapid narrowing down of the field of suspects—from an initial infinity of possible causes to a manageable few.

This is essentially the familiar "20-Questions" game approach. Just as the game permits the player initially to narrow an unlimited set of possibilities into one of three categories—animal, vegetable, or mineral—so do controlled experiments and analyses permit variation

in output or performance to be immediately narrowed into one of several basic categories that indicate the nature and location of its causes. Once this initial separation is established, further questioning and controlled experimentation lead inexorably to the root causes.

#### *Functional performance*

This fundamental approach is applied to the product in various stages of development. For example, the most critical causes affecting functional performance are determined by statistically designed experiments with working models. At least two models are used to allow unexpected variations to show themselves, so that proper comparisons of outlets and, if possible, interchange of parts will disclose significant, although occasionally small, performance differences. This is the statistical rather than the "hunch" technique.

#### *Accelerated life tests of prototypes*

Similarly, statistically designed life tests are conducted on at least two prototype units, with test equipment designed to simulate selected environments. These uncover the most critical environments affecting the life of the product. Units are operated at successively higher levels of stress as the environment is imposed increasingly more severely than specified, and the design of each weakest link that fails is strengthened. Additional modes of

failure are thus revealed. This phase of the program stops when a mode is finally exposed that is shown to have a statistically low likelihood of occurring at operational environments. This approach will lead into life-test programs when modes of failure are found to change with time.

#### *Early production units*

Early production units are then subjected to statistically controlled tests. These units, made in three groups with time intervals between groups, permit further refinement of the within-unit, unit-to-unit, and time-to-time analysis.

#### *Product-life test and reliability measures*

At this point in the program, you are ready to identify additional causes for failure that may have been introduced and to provide assurance that the manufactured product will exhibit satisfactory life service. Experiments are designed to determine causes of early failures. After these vital causes are controlled, the percentage surviving test environments at the specified life is estimated, and reliability is expressed within appropriate statistical confidence levels.

It is only at this stage, after a development program to determine causes of failure and to eliminate or control them, that it becomes worthwhile to seek statistical measures of reliability.

### *Evaluation of service reliability*

A program should then be established to uncover, before they occur in use, failures that would reduce the intended service life of the product under actual rather than simulated environments. This involves evaluating the condition of high-time units returned from the field and estimating, from additional tests, the life remaining in the product sampled. A scientific sampling plan is designed to obtain a representative picture of field applications; then when failures occur prior to the planned total life, the product is available to determine whether they were due to environment, product design, or oversight in inspection or testing.

### *Statistical Techniques*

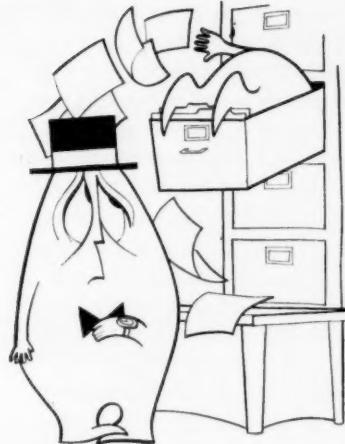
The philosophy of the "20-Questions" technique outlined above is simple and clear-cut. Its success, however, depends on two vital factors: (1) the ability to ask the right questions, and (2) the meaningful analysis and interpretation of data. The implementation of this approach involves skill in using a variety of mathematical and statistical techniques. Among the most effective are:

1. *Techniques to Identify the Nature of Variations*
  - a. Multi-Vari charts
  - b. Statistical control plans
  - c. Process capability determinations

- d. Square or other fractional factorial designs
- e. Correlation analyses

2. *Screening Techniques to Identify the Source of Variations*
  - a. Multiple balance experimental designs
  - b. Parallel-path experiments
  - c. Component search-pattern interchanges (factorial design basis)
3. *Techniques to Study Cause-and-Effect Relationships*
  - a. Factorial and fractional factorial experimental designs
  - b. Multiple balance experimental designs
  - c. Statistical significance testing
  - d. Response surface analysis—evolutionary experimental techniques
4. *Life Testing: Distribution analysis, normal curve, log normal curve, and Weibull plotting.*

The mathematics involved in this approach to product reliability are not Einsteinian, but somebody on the staff should have sufficient statistical skill to be able to speak the same language as the specifiers and to understand and explain what is involved. Most important, he can help to install the preventive and control measures necessary to take product reliability out of the realm of wishful thinking and make it a demonstrated fact within the company. ♦



## *Now—Automated Information Retrieval*

*Condensed from Business Week*

STALLED by a missile production problem, a metallurgist recently asked the American Society for Metals: "What has been written on impact-forming of metals at high speeds?" Within half an hour, automatic equipment—operated for the society by Western Reserve University in Cleveland as part of its Center for Documentation and Communication Research—had searched 50,000 abstracts and clacked out the requested list of titles in code.

In the nation's capital, an even more elaborate system, under the code name of "Walnut," will soon go a step further. For the Central Intelligence Agency, it will spew out microfilm copies of entire documents, in answer to whatever question is asked about military intelligence.

Both systems are part of the new technology of automatic information retrieval. As in data-processing, machines are being groomed to do a job that's too vast and too fast

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for manual methods and conventional office equipment.

A prime market for automatic information retrieval is opening up in the field of technical literature. Each year, technical writers prepare 60,000 books, 100,000 research treatises, and 1.3 million articles, all over the world. And, somewhere on this globe, a new technical journal joins the ranks every day; already 55,000 journals are published throughout the world.

Scientists and engineers obviously can't plow through all the reports and journals they should to keep pace. They need a fast way to lay their hands on specific subjects. And that calls for a practical method of assimilating the torrent of material, classifying it, and compressing it into an index that's complete, up to date, and understandable.

#### **Time-Saver**

With such a system accessible to him, the researcher can focus on the literature that's pertinent to his general problem, then hunt up the articles that sound promising. This can spare him months or years of duplicating research that someone else may have done 25 years before. But he must be able to rely on speed in finding what he is looking for, else he might waste precious time.

A company that wants to keep its technical men fully up to date can do one of two things: It can subscribe to one of the 350 or so

professional indexing and abstracting services around the country. These keep an eye on almost all technical publications; the trouble is that many of them are either months or years behind in their own reading, or not able to cover the field as widely as they should. Or a company can start its own indexed technical library. Few but the largest companies, however, care to spend the time and money it takes to update such a library, at least with conventional indexing.

#### ***Promise of Machines***

The new information-retrieval machines promise to break the bottleneck in making technical papers accessible. Some fifty or sixty companies, including such giants as International Business Machines Corp. and Remington Rand Div. of Sperry Rand Corp., see a vast market for electronic hardware they are developing for this field, and thirty or so colleges and universities are also researching the area.

Right now, about 1.5 billion dollars a year—roughly 12 per cent of the nation's annual spending on research and development—goes for "information services" or searching the literature. Much of this could be mechanized, the equipment-makers feel.

But some researchers are skeptical about this "purely equipment" approach to the problem. They feel that more than sheer bulk of technical literature is to blame for

the breakdown in communication. Some, therefore, are studying the fundamentals of how technical men communicate among themselves and what it is they really need to know.

IBM is analyzing the communication characteristics of thirty top scientists at its research center in Yorktown, N. Y. It's watching what articles they read and in what journals, and probing into their other sources of information.

"After we've isolated the real problem and defined it," says IBM's Dr. Manfred Kochen, "we may discover that information retrieval can really be handled by humans after all. If so, this is a perfectly valid conclusion. If we feel machines are essential, then we'll try to specify what sort of machine is needed."

#### **All Sizes and Shapes**

Automatic systems come in all sizes and shapes. Some users need only a simple card punch, card file, and card sorter; the punch cards carry much the same information as a typewritten card in a library catalogue.

Schering Corp., for example, uses an IBM 101 Electronic Statistical Machine and a card file to index a library of 15,000 drug-journal articles that go back five years; equipment costs only \$525 a month to rent. E. I. du Pont de Nemours & Co. uses similar equipment at its central research department in Wilmington, Del., to index 2300 chemical reports.

Sometimes more than the title and subject of an article is kept in the file. As in Minnesota Mining & Mfg. Co.'s Filmsort, the entire article may be microfilmed in a small window on the punch card. Microphotography and magnetic tape are often prescribed in the more elaborate systems in conjunction with electronic computers. This speeds up the search considerably, of course.

#### **Big Systems**

Typical of the newer systems for large-scope retrieval is Avco Corp.'s Verac. Each of the foot-square glass plates in its memory can hold microphotos of 10,000 images or pages of documents. In less than one second, Avco claims, Verac can single out a desired page and display it. The index system is separate. So far, no price has been set, but it will likely be in the seven-figure bracket.

Eastman Kodak Co.'s Minicard system puts a cross-indexed document of several pages, plus an abstract, on a bit of microfilm the size of a postage stamp. About 2000 of them can be stored. Price: about two million dollars.

Remington Rand has delivered a Univac computer to the Armed Services Technical Information Agency as part of a huge index system for 240,000 reports on past and present Defense Dept. R&D contracts. It turns out a list of titles.

The Walnut system teams an IBM 1410 computer with a micro-film memory to index and store the hundreds of security reports that pour into CIA each day. Up to now, indexing has required forty million punch cards.

The kernel of Walnut is its memory system, using Kalfax, a new type of film from Kalvar Corp. Kalfax is developed by heat rather than by chemicals. A document page will first be reduced to ordinary microfilm; then it is reduced again on Kalfax to the size of a pinhead.

Fifty strips of Kalfax, each holding 99 document pages, hang in a rectangular plastic box called a "cell." Two hundred such cells go together to form a circular module about six feet in diameter, holding 990,000 document pages—equal to about 850 copies of Tolstoy's lengthy novel, *War and Peace*. The IBM 1410 can be programmed to read key words in a request for

information and print out pertinent titles. A card is also punched for each title.

After the searcher looks over the print-out to see what seems useful, he feeds the corresponding punch cards into the "image file." The selected strips from the "cells" are paraded in front of ultraviolet light, and the prescribed frames of Kalfax film are automatically enlarged onto a small microfilm window in an IBM card. In seconds, the card is flipped out, bearing the tiny Kalfax image. This can be projected or read in a special viewer.

No one can be sure how far mechanization will go in large-scale information retrieval. Besides the regular search and retrieval systems, it will depend partly on how rapidly "accessory" equipment comes along: machines for language translation, report reading, abstracting, and indexing. Progress on these support systems has been fairly rapid. ♦

### Does Your Company Lack Ad Objectives?

WHO SETS the advertising objectives in your company? Chances are that nobody does, for this is the case in three-quarters of the companies recently surveyed by John Sargent, management consultant of New York. Mr. Sargent, reports *Industrial Marketing*, found that:

- About 75 per cent of industrial-products firms have not established objectives for their advertising.
- Approximately 16 per cent have set up some objectives for their advertising, but these objectives are not well integrated into the companies' over-all objectives.
- Only 9 per cent of the companies have over-all company, marketing, and related objectives, and are using them as the basis for their advertising programs.

When ad objectives are lacking, says Mr. Sargent, advertising is not contributing as effectively as possible toward over-all company success.

# The Hard Realities of Retraining

*Condensed from Fortune*

THE MOST FASHIONABLE remedy at the moment for depressed areas, nagging unemployment, and sagging economic growth is retraining. Members of both political parties sing its praises; collective bargaining has embraced it; and President Kennedy has recently proposed a program, expected to cost 700 million dollars over a four-year period, to retrain and relocate 800,000 unemployed workers.

The hope is that retraining will not only relieve current unemployment but will help solve the national manpower problems of the next decade. Technological advance will demand more and more skilled workers while, simultaneously, it reduces the number of jobs for the unskilled. With present population and job trends, there may develop a shortage of skilled workers that will cut into production and profits, plus a growing caste of "unemployables" on the public rolls. An all-out effort to uplift the whole labor force looks like the simple answer.

But despite the high hopes and hearty testimonials it has aroused, retraining has so far proved something less than an economic cure-all. Senators Clark and Douglas, who have introduced legislation on the subject, do not yet have a clear idea of how to go about it. Several state governments, including Michigan, California, and West Virginia, have authorized retraining programs in one form or another, but have few results to show for it. Pennsylvania in 1957 amended its school law to provide training at public expense for the unemployed. During the recession of 1957-58, 1761 people enrolled in courses in seven subjects, 884 completed the course, and 741 of these were placed in jobs. The results are not very impressive in a state where 500,000 were unemployed at the time.

One retraining experiment, hailed in 1959 as a landmark of collective bargaining, has proved extremely disappointing. One meat packer and the meat-packing unions established

*Fortune* (July, 1961), © 1961 by Time Inc.

a 500,000-dollar fund to find solutions to the problems arising from the displacement of employees under the company's modernization program. When the company closed its plant in Oklahoma City, the 433 employees who were laid off were given a chance to learn new skills that would enable them to seek jobs outside the meat industry. About 170 applied. But in aptitude tests given by the Oklahoma Employment Service, only sixty were judged able to benefit from some kind of training. The rest were referred to the already overcrowded market for common labor. Those who were trained—for such jobs as typing, upholstering, beauty operation, and auto mechanics—were cast loose in the recession-hit labor market; and some of those who found jobs had to take substantial pay cuts. The results have been disillusioning for the union-management committee that administered the fund, and it no longer considers retraining the major weapon for dealing with unemployment problems in the meatpacking industry.

#### **"Retraining for What?"**

This one experience offers a vivid demonstration of what retraining cannot do. The committee, inexperienced in the techniques of relocating workers, undertook on an emergency basis to refit a group of suddenly unemployed workers with skills for which a depressed local job market had little demand. "Re-

training for what?" asks one committee member, James Wishart, research director of the Amalgamated Meat Cutters. "On a loose labor market you are just raising the educational level of the unemployed." The committee's executive director, Robben W. Fleming, professor of labor law at the University of Illinois, questions the efficacy of "crash" programs inaugurated after the crisis is at hand, and he concludes that "there are some things which are beyond the power of individual companies or unions."

#### ***What the Company Can Do***

But there are some things individual companies can do, and many corporations have been doing them for a long time. Where there is a constantly advancing technology, there is a continual need to retrain employees for new jobs in the plant. Ford last year retrained nearly 3000 workers to handle more advanced hydraulic and electrical equipment. General Motors, in addition to conducting apprenticeship programs, re-trains 7200 employees a year—for example, it converts a production-assembly worker into a tool-and-die worker. IBM re-trains about 100,000 workers for other companies each year to operate the computers and other equipment it sells and leases.

The Xerox Corp., Rochester, New York, a company with a rapidly changing product line (copying machines), trains certain employees

to take jobs that do not yet exist, while it is preparing to introduce new processes that will eliminate their old jobs. At an estimated cost of \$1750 per man, the company has given a total of 68 men a six-week training course in machine-shop techniques and mechanical assembly, then assigned them to temporary work until jobs developed in its fast-growing machine manufacturing or assembly departments. This training was given to men with ten or more years' seniority, who otherwise would have had to be laid off while machinists were being hired in the open labor market.

#### **Federal Assault**

To supplement industry's retraining efforts, the federal government is aiming a broad assault at general unemployment. The program will be dealing principally with the approximately two million Americans who have been out of work sixteen weeks or more. Three out of four of these long-term unemployed did not finish high school; one in three is a worker over 45 years of age; one in five is a Negro. (There is, of course, considerable overlapping in these groups.) To be effective, retraining must take into account the special problems of each group. For example, retraining the over-45's will be futile unless it is coupled with a strenuous campaign to dissolve the common belief that these workers are too old to be taught new techniques. Likewise,

any effort to raise Negroes out of the common-labor class will succeed only after the discriminative barriers raised by both management and labor are broken down.

#### **Educational Deficiencies**

With many of the young unemployed, the problem is not only lack of skill, but also lack of basic education. The "drop-out," the boy who leaves high school before graduation, is often doomed to menial work, and he may not even be able to get anything out of training. In Cleveland, Thompson Ramo Wooldridge Inc. recently gave twenty of the long-term unemployed a training course to turn them into semiskilled machine operators. The men turned out to lack rudimentary understanding of fractions or decimal points, so they could not learn simple blueprint reading. Then the Cleveland Electric Illuminating Co. stepped in and financed a short course in simple mathematics. With fractions and decimals in hand, twelve of the twenty original trainees were able to go back to Thompson Ramo Wooldridge to continue the course.

Seymour Wolfbein, head of the Labor Department's newly created Office of Automation and Manpower, views the problem of retraining realistically enough to recognize that no Washington-prescribed cure-alls will do the trick. It is not simply a matter of finding out how many jobs are going begging for lack of skilled workers and then training

the same number of the unskilled unemployed to fill them. As one union official puts it, "You can't teach a meatcutter to be an electronics technician."

The question is rather one of upgrading the labor force by small stages all along the line—teaching the laborer minor skills, equipping the semiskilled with new techniques, and turning the skilled into advanced technicians and junior engineers. Even some who have been doomed as unemployable may have a place in this scheme. Wolfbein cites the case of the restaurant chain that hired a number of men whose I.Q.'s averaged only 68 and put

them to work wiping off lipstick traces that remained on glasses after they went through the automatic dishwasher. It took a bit of time, but the men learned it and became useful workers. With a little ingenuity, Wolfbein believes, industry could make use of many of the unskilled workers it now discards, by teaching them enough to climb at least one rung on the job ladder, thereby freeing better-trained workers to learn even higher skills. This method of gradually pushing up the work force is likely to look more attractive to corporation management if the shortage of skilled workers develops as expected. ♦

### **Consumer Attitudes—Cautious Optimism**

"CAUTIOUS OPTIMISM" now prevails among U.S. consumers, the University of Michigan Survey Research Center reported last month. Summarizing its latest quarterly survey of consumer attitudes and inclinations to buy, the Center said:

"People in all walks of life realize that business trends have turned up and anticipate further improvement . . . But awareness of substantial unemployment and concern with its persistence represent enduring effects of the 1958 and 1961 recessions, and restrain consumer optimism."

Nearly half of the 1300 adults interviewed in the survey felt it was a "good time to buy" cars, houses, and large household goods, the Center said. An unusually large proportion of would-be auto buyers plan to purchase new cars during the last three months of 1961. Plans to buy new homes are somewhat higher than they were in last year's survey, but still substantially below plans in June, 1959. Intentions to make improvements, additions, or repairs to owner-occupied homes are reported with the same frequency as a year ago.

"To be sure," the Center summarizes, "rising incomes plus cautious optimism will be reflected in larger sales to consumers. But increasing consumer purchases will hardly pave the way for a vigorous and enduring upturn of our economy, unless concern about unemployment can be dissipated."



## —1961 Model

By Melvin Mandell

*Condensed from Dun's Review and Modern Industry*

**T**HE WORK of preparing the 1961 annual report is, for most companies, fairly well along. By now, they have the over-all concept of the report decided on, its covers designed, and the first charts blocked out.

Never an easy task, preparing the annual report will be particularly difficult in 1961. In fact, most cor-

porate managements now find themselves facing a sizable dilemma. The recession remains uppermost in the minds of management and stockholders alike. Stockowners remember how management had to right itself in 1960 by slashing costs vigorously. Management, equally aware of that fact, is keeping a close eye on expenditures during

*Dun's Review and Modern Industry* (July, 1961), © 1961 by  
Dun & Bradstreet Publications Corporation.

this comeback year, particularly in the advertising and public-relations budgets.

There lies the problem. Should the annual report for 1961 be the lavish job of recent years, guaranteed to impress stockholders and perhaps sell some of the company's products? Or should it be an austerity model, to show stockholders, as well as unions and price-conscious customers, that management still is keeping a sharp eye on costs?

One trend seems clear. For all the emphasis on keeping down costs, most 1961 reports will remain as glossy and highly colored as in former years. There, though, the line will hold. Annual reports have reached their peak, most companies feel, and few of them plan to bring out a publication more lavish than earlier ones.

This, management feels, will satisfy stockholders and preserve the corporate image. "This year," explains one top executive, "we thought everybody would come out with a subdued report because of the recession. When they didn't, that was the tip-off. If 1960 didn't do it, reports will remain just as lavish for this year."

#### **Management Speaks Out**

More than ever before, management probably will speak its mind on the major economic and political issues of the day in the 1961 report. In the past, of course, the chief executive's message generally was

restricted to a review of sales, earnings, and the general course of the year.

Now, though, management feels that it is inextricably tied in with Washington legislation, foreign affairs, and similar subjects heretofore alien to annual reports. With that in mind, business is becoming emboldened to speak out. In fact, some companies already have. Scott Paper's president, Thomas B. McCabe, for instance, used the 1960 annual report to criticize irresponsible union leadership and to call for restraint on the Administration's part in dealing with the recession. Similarly, President Monroe J. Rathbone, in the Standard Oil Co. (New Jersey) 1960 annual report, pointed out the importance to the nation of business investments abroad.

#### **Objections?**

Will stockholders object? If anything, they apparently applaud such efforts. General Electric, for example, a few years ago conducted a survey among its stockholders on the desirability of the company speaking out on public affairs in general. Not only did stockholders feel management should speak out on legislation affecting the company, but they also believed it should make its position known on the broad issues of the day.

At the same time, management is not overlooking that part of the annual report that stockholders supposedly often skip: the long list

of figures on sales, earnings, dividends, assets, and other categories which show a company's growth record over a five-, ten-, or fifteen-year period. Surveys taken by various companies show that these assertedly dry tables rate a surprisingly high degree of readership among their stockholders.

There is particular reason to stress them in the 1961 reports. The financial pages of the newspapers have been playing up stories that broad segments of industry have stopped growing. So many an individual corporation has become increasingly anxious to point out its own growth status to its stockholders. Most companies probably will devote two pages in their reports to a historical summary, rather than one. When GE used that strategy, it increased the readership of its 15-year summary by 70 per cent.

In another trend, more companies now are putting out second sections of the annual report in which their financial records are detailed. Among such companies are Bristol-Myers, Radio Corp. of America, General Telephone, General Dynamics, and Clevite.

#### **Rising Costs**

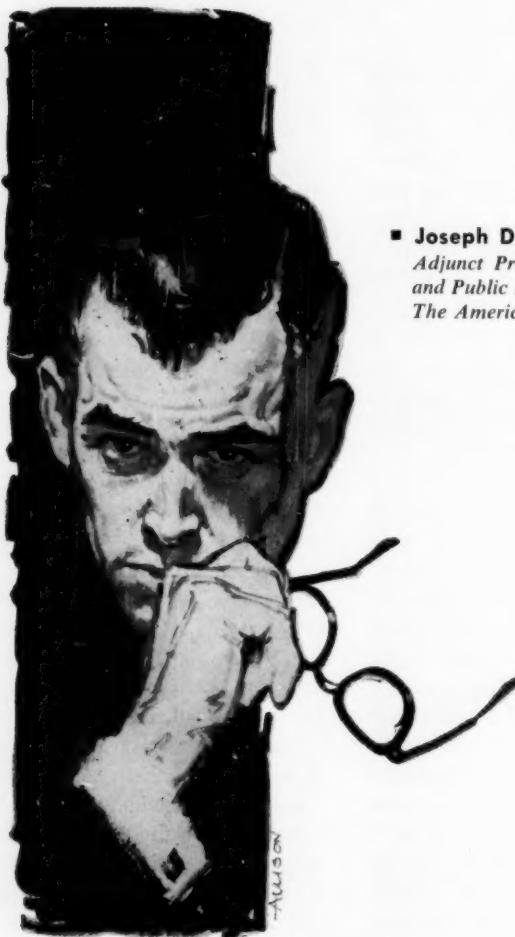
What about costs of the 1961 annual reports? The expense of producing even a comparatively simple report has risen sharply. Currently, the cost is believed to range anywhere from seven cents for the comparatively few companies that

give a bald recital of facts and figures to as high as \$3.45 a copy. The average probably runs to about fifty cents a copy, with one company in ten spending one dollar or more. For a company with 35,000 stockholders—a number that is by no means extraordinary—even a fifty-cent annual report adds up to a hefty sum.

Despite costs, however, one company continues to bombard suppliers, important customers, heads of farm and civic organizations, college economics classes, and libraries, plus every one of its 33,000 employees and 50,000 stockholders.

The justifications for such wide distribution are obvious. "The annual report today is more than a legal document," notes Harold W. Comfort, President of The Borden Co. "It's a means of friendly communication with stockholders, an informative booklet for employees, a catalog of company products, a fact sheet for the business press, a community-relations tool, a text book for business classes, a good-will builder among suppliers and important customers, and a manual for salesmen."

No matter what form it takes, there still remains one major requirement in a good annual report. "In the final analysis," says Vice President Adam Rathgeber of American Hardware Corp., "the slickest, most elaborate annual report in the world isn't one bit better than the story its figures tell. ♦



■ **Joseph D. Cooper**

*Adjunct Professor of Government  
and Public Administration  
The American University*

OF THE MANY FACETS of decision-making, two deserve special attention because of the casualness with which they are often treated: (1) the moment of judgment—of actual decision; that is, the surmounting of the final uncertainties and

hesitations; and (2) the follow-through after the decision; the successful carrying out of the action decided upon.

One of the weak links in the chain of decision-making and action is the planning of the specific means

A MANAGEMENT REVIEW SPECIAL FEATURE

# Making Decisions— and making them stick

through which decisions are to be put into effect. In many cases, this should be done tentatively before the final decision is reached; that is, you should have a good view of the effects of a decision before you actually make the decision. Hence,

the aftermath of the decision is also its preface, and your skill and success in anticipating the effects of a decision will do much to assure its correctness.

These are important topics that demand sober thought by the execu-

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This article is based on a chapter from Mr. Cooper's forthcoming book, *The Art of Decision-Making*, which will be published later this month by Doubleday & Company, Inc. Copyright © 1961 by Joseph D. Cooper.

tive, particularly in view of the current penchant for "mechanical" rules of judgment.

The "rules" of decision-making—define the problem, get the facts, weigh them, and decide—are deceptively simple. Even "defining the problem" is not always as easy as it may sound. First the problem must be recognized, and we cannot afford to wait for the flash insight of the researcher; we must anticipate problems and organize to deal with them. Thus we rely on procedural devices that automatically trigger attention to a problem; e. g., a report of a build-up in accounts receivable due to slow payments will tell us to look into selling practices, the economic climate, credit policy, sales forecasts, and so on.

Many problems are spontaneously generated. A big contract is canceled; a plant is destroyed by fire; a challenging business proposal is received in the mail. Others are spotted by official monitors—analysts or reviewers who sift through the raw intelligence to spot trends or forecast events of significance.

#### ***Fact-finding and Analysis***

After the problem is recognized, it is time for fact-finding and analysis—assessing the situation in the light of the experience of the past and present and projections of the future, redefining the problem if necessary, and keeping an open mind until all the significant information has been accumulated.

This work—and it is hard, painstaking work—is all directed toward one moment: the point at which the actual decision is made. The decision is a moment of climax. At some point, the fact-finding, discussion, and analysis must come to a halt and a choice must finally be made.

#### ***A Lonely Business***

"Decision-making is a lonely business," said Clarence B. Randall, "and the greater the degree of responsibility, the more intense the loneliness. It is human to wish to share the risk of error and to feel the comforting strength of outside support, like the flying buttresses along the wall of a medieval cathedral. But the strong man, the one who gives free enterprise its vitality, is the man who weighs thoughtfully the entire range of available opinion and then determines policy by relying solely on his own judgment."

On important issues, the executive must feel that he is right in the decisions that he makes; he must follow his own instincts—his own logical and ethical judgments. At the same time, he cannot fly in the face of the recommendations of his subordinates without some risk of losing their devotion and loyalty. Accordingly, he may find it expedient to defer to them on the decisions whose consequences are not very great and where the certainties of judgment—at least on his part—are also not very great.

### **The Hesitant Decision**

A source of great frustration and demoralization is the executive who is constantly reopening decisions or who permits his people to convince him to do so. It is not wrong to reopen a decision occasionally, when new facts or new perspectives warrant doing this. Where this is a chronic condition, however, it should be a cause for real concern. Here are four of the more common reasons why decisions are reopened:

1. *New perspective.* The morning after the decision brings a cry of "Hold everything; I have a better solution." Who can say no to this? Again, if the next morning brings further improvements, who can deny those? At some point, however, someone must say, "We're constantly improving, but we're not getting anything done."

2. *Incomplete decisions.* "There's something else we didn't think of," cries the decision-maker, thereby rallying his flock to a new round of conferences. This is a more general kind of procedural failure. It might have started with a failure to define and subdivide the problem sufficiently. The initial fact-finding may have been too limited. The points of view brought to bear on the problem may have been too restrictive.

3. *Fear of action.* A decision has been made; for the sake of argument, a very good decision. The

executive delays taking action, asking, "What if . . . ?" or, "Did we consider . . . ?" or that catch-all blockbuster, "Is this what we *really* want to do?" The particular question raised really does not matter; the man looking for a way out will think of a new one if a reasonable answer is made. Where there is a recurring pattern of this kind of delay, it suggests a deep-seated fear of exercising responsibility and facing the possible consequences of failure.

4. *End-running.* Because of the way they operate, you may not know the end-runners until you become the executive who has them within his purview. Then you are bothered by some few people who, after the decision has been made, approach you privately to have it changed or set aside. The executive imperils his finer judgment when he submits to the suasions of those who care nothing about the regularized processes of conducting business. Compelling though the arguments may seem, the executive is best off in the long run by discouraging the end-runners.

### **The Elements of Action**

A decision is a point reached in the stream of action. It triggers the making of subsidiary decisions and implementing decisions. When you have made a decision you have not yet really changed anything. You have yet to lay out the steps in detail which will get you from

where you are to where you want to go.

The first step in elaborating the decision goals is to identify the key subsidiary actions and their sequences, interrelationships, and interdependencies. This information will later be necessary for assignment and coordination.

If the magnitude and complexity of the task require it, the activity being developed may need to be split down further and further in its refinement. Contributions of effort may be required from people throughout the enterprise at many different levels.

The unknowns that preceded the act of decision will be carried forward in some measure into the details of the plan itself. You must identify the major calculated risks and the major areas of breakthrough, for these two are pivotal points upon which success or failure must depend. *They* are the items that may require a greater use of resources than at first anticipated. For each of the critical points of action, you must establish criteria of successful accomplishment.

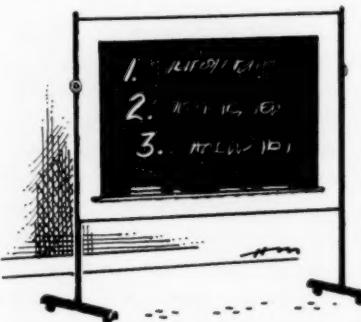
#### **Program Requirements**

As you elaborate your decision goals, you begin evolving the outline of your operating plan. This plan must be expanded further through the assignment of resources (personnel, funds, facilities, materials, time, etc.) to specific tasks.

Resource requirements should be

developed by those who have the greatest familiarity with the tasks to be accomplished. Early in the game you must identify those who are to be responsible for specific assignments. This is done in major blocks of activity, so that those responsible for each may make sub-assignments.

The estimates of resource requirements must also be translated into



financial needs. These tend, at first, to be excessive, but a review is expected to bring the costs within allowable financial ceilings and other operating limitations.

Initially, avoid reducing cost at the expense of limiting the basic objectives. It is amazing how many items can be trimmed for lack of basic utility. If this does not bring you within spending limits, however, you may need to re-examine the basic objectives and requirements with two possible outcomes in mind: (1) redefinition of objectives and requirements to bring them within reach of your dollar capabilities, or

(2) abandonment or postponement of the effort as something you cannot now afford.

#### **Assignments and Schedules**

Assignments of responsibility are laid out in varying degrees of detail in the operating schedules. These may need to be supplemented with written and oral specifications of tasks to be performed and their relationship to what others are doing.

The schedule is the visible blueprint of action. It takes everything that is to be done and lays it out in a time frame. It shows the successive unfolding of steps needed to achieve subsidiary goals. It shows how these become the major components of larger goals, which finally merge together into the total end-product. Some of the steps must be plotted in sequence; others must be carried out simultaneously. The inputs and outputs of all of them must be threaded together so that they will all fall into place at the right time. To add to the complexity of this blueprinting effort, all outputs must be in balance; none can contribute less than is required of it nor more than is needed.

The actions must be planned so that resources are not assigned prematurely or excessively. Thus, an activity may require ten men at its peak, but in its make-ready stages it may require only one or two. During the phasing-out of an activ-

ity it may be possible to take people off, so that they may be assigned elsewhere. In other situations it may be necessary to assign more effort in the initial stages because of reduced productivity during training.

Experience with the particular operational process will provide clues to the plotting of critical lead times and priorities. If it takes three months to procure a piece of equipment, this procurement must be scheduled long in advance, not when the equipment suddenly must be put into operating use.

#### **Control and Evaluation**

Once the plan is activated, it must be monitored and coordinated until it is finally completed. There will be slippages. There will be unforeseen contingencies. There will be failures in communication, so that different people will get out of coordination. There will also be some tendency to veer away from the previously assigned goals and criteria of performance.

The reporting of accomplishment against previously assigned and defined targets is the principal means of assuring compliance with the master plan. The reporting system must clearly show whether the target is met or whether it isn't. The system thus operates impersonally to advise the management that a trouble spot exists so that corrective action may be taken. The fact that one is obliged to report his progress

or the lack of it, specifically, in itself acts as a major incentive to avoid failures by all possible means.

Although the procedures of regular reporting will show up any deviations from plan, it is usually desirable to supplement this at major junctions of activity by conducting a broad program review. After all, it is possible that conditions may have changed, or that your experiences in going through with the plan of action suggest that major or minor revisions could be made.

#### ***Taking Action***

For program-planning to be realistic, it must be based on intimate knowledge of conditions. In most cases, this must be achieved by the participation of a number of people, working in concert. This is easier said than done. The big obstacle is the complexity of the program-planning process itself.

For one thing, the work is divided in parallel: those aspects that can be done simultaneously by different people, with coordination among them at key intervals. Then, for each of the parallel lines of effort and for the program as a whole, the work moves forward in a sequence of events.

A flow diagram of the program would show each separate line of effort moving forward and then looping backward to correct and adjust original assumptions in the light of experience. At key junctures

parallel lines would merge, and the combined effort would then be seen as an alternately progressing and back-looping effort.

Over the whole of such a program plan is imposed a fine network of intercommunication. Operating information is transferred among the doers. Pieces are added in sequence. Reviews and examinations are made. Trouble signals are transmitted to control points. Progress reports are made. Any of these can also trigger the need for decisions and actions.

The total effort calls for clear understanding by all of the tasks expected of them. Now for the rub: It is one thing to tell people that they have taken certain tasks to do, as part of a greater effort; it is another to have them perform exactly as intended. Obviously this calls for some considerable skill in communication. Clear instructions are not enough; you must make sure that separate departments have clear understandings of their respective roles in the situation so that they will be able to interpret instructions and accept responsibility correctly.

#### ***The Mood of Action***

When you explore the situation for guidance in giving orders, you must become aware of other conditioning factors which may have a bearing on either the strategy or timing of action. One of these is the mood of the group and its leadership. You have seen instances

where all the odds were against success, where the people did not know this, and where they carried the day brilliantly in spite of incapacities and inefficiencies. You have also seen less dynamic and more straightforward situations which present a pattern of successful action compounded of (1) a high confidence factor, (2) good organization, and (3) experience in getting things done.

When these elements are present, you can feel the mood of success. It operates on a momentum of its own, carrying the day for its adherents against all odds. Wise is the executive who takes advantage of this, even as the pilot rides with favorable tail winds.

The mood of the leader may, in itself, be sufficient to carry the issue—or vice versa. He must be able to appraise the situation and sense whether, even in the face of adversity, his actions might bring the results desired.

### **Timing**

Your reading of the situational mood or climate should give you a feeling of the psychological timing of action: when to announce the decision or begin putting it into effect so that it will be most acceptable (or least unacceptable), provided you have any discretion as to timing.

Psychological timing is important whenever there is to be a significant alteration of the pattern of vested

personal rights and work ways. It is also important to choose the right moment when interest and zeal can be maximized for that extra burst of drive toward accomplishment.

Here are a number of techniques for achieving good psychological timing:

1. Annex the action to another activity or program which will more certainly carry a strong action imperative. For example, a planning assignment can be annexed to budget preparation.

2. Take action at a time when a new situation itself dictates change. For example, a new key official usually is recognized as having the prerogative of effecting important procedural and personnel changes, *during his early days in office*. An accident justifies pertinent operational or physical changes. A turn-down in the financial picture gives protective cover for drastic personnel changes or reductions.

3. Pave the way for the action of taking preliminary steps. For example, remove procedural obstacles or fill operational or procedural gaps. Win the confidence of key individuals whose acceptance and example will bring others into camp. Take action on a nominal or break-in scale, to let people have a taste of the major action to come.

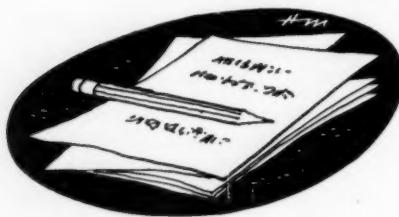
4. Wait for the situational climate to change, either of its own accord or through precipitating actions.

You won't always be able to

choose your own timing, but it's still important to get a feeling of the mood of the situation so that you can do whatever is necessary to minimize the disadvantages and maximize the gains.

#### **Limited Commitment**

When the costs or consequences of a failure may be substantial, you want to "hedge your bets." You want some opportunity for recovery in case things don't work out as



planned or desired. Consider another case: You approach the taking of action with some hesitance, for you are uncertain of much of the effects of your action. Aside from trying to peer into the veiled future, what else can you do?

#### **Trial Runs**

One thing you can do is divide the action, where feasible and practicable, so as to commit a minimum of resources while you observe how things shape up. The trial run or sample installation constitutes a sort of microcosm of the full activity which, after "debugging," is then expanded.

Another approach, when you can-

not release a trial balloon, is to divide the effort in sequence. You monitor your experience with each subtarget and use the intelligence derived therefrom as a basis for correcting both preceding and succeeding steps. This technique avoids full irretrievable commitment. It is applicable also to the small-scale trial installation, so as to limit even its commitments.

The underlying principle here is that until you take real action in its normal (or at least closely simulated) environment, you are limited to assumptions and guesses, however educated they may be.

#### **Building in Flexibility**

Now we come to one of the key aspects of planning: the building in of flexibility and maneuverability. For each of the critical steps you must set forth the conditions of successful performance (or the probable response patterns). Then you ask: "What do I do at this stage if things don't go as I planned them?" You answer by devising alternative courses of action.

As the plan of action takes real form you then keep on the alert for any signs of nonperformance. The trick is to detect these well in advance of the actual default or slippage. When you can do this, you avoid unnecessary commitment and expenditure of resources. You also find time for corrective action before an actual crisis develops.

The key to perfecting a plan that

has uncertainties, therefore, is to move from the stages of conjecture and planning to the ultimate one of operating in the "real world."

### **Emergency Decisions**

There are always emergencies when it is not possible to go through the procedures of orderly fact-finding, digestion, consultation, and selection from among careful engineered alternatives. To insist on ordered decision-making under true emergency conditions would be naive, to say the least. There would, however, be cause for real concern if emergency decision-making were the rule, rather than the exception.

The judgment as to whether to make or defer an emergency decision depends mainly on the consequences of not acting. Because of the risks of such peremptory judgment, the advantage must be more

than marginal. That is, the probable gain or advantage must not be offset greatly by the probable risks.

There can be no set of rules for emergency decision-making; each situation has its own law of action, which can be derived only from an understanding of the interplay of elements in the situation. But this does not mean that all reason must be abandoned. Insofar as he can do so, the executive must go through all the steps in problem analysis and decision.

The existence of an emergency means only that there is less time for fact-finding and consideration. If anything, there needs to be a higher order of thinking and acting than under normal conditions. The action and its effects must be monitored closely to identify quickly the need for corrective action. As soon as possible, normal handling of the matter should be restored. ♦

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**WHAT MAKES A VITAL BUSINESS?** Vital people make it. It is not to be found in things, in machines, or dollars, or material resources of any kind. Vitality is something people demonstrate through sustained competence; through creative, venturesome drive; and through a strong feeling of ethical responsibility, which means an inner need to do what is right and not just what one is required to do. . . .

In an economy that is growing and changing as ours is, we cannot now describe or even imagine how the vitality we generate today will affect the future. But we may safely predict that if we can sustain and increase vitality in business leadership and all business people, the society in which our children will live will be better, happier, and wiser. This is a goal worthy of our very best.

—Frederick R. Kappel in *Vitality in a Business Enterprise*.

# Business Ethics and the Law

By Henry Ford II

*Condensed from Industry*

I AM CONCERNED at a recent chain of events affecting some of our oldest and most respected companies—events that could arouse broad popular distrust and revive old and worn-out hostilities toward U.S. business and industry. I would not like to see the good will and confidence that business has laboriously built up over the years washed away at this very critical juncture in our history.

If we are to preserve the good names of our respective companies, our corporate executives must keep their own house in order. If and when they fail to do so, the house-cleaning job will certainly be put in less friendly hands. We now run a serious risk of having codes with sharp teeth imposed on business by a federal legislature. Because such codes would further restrict the areas of free business action and decision, we must, in our various companies and industries, see to the establishment of our own formal principles of ethical practice, plus the effective means of self-policing those principles.

Too often, however, ethical principles are not enough. Along with most businessmen, I believe that strong and effective antitrust law is essential, that it preserves competition, and that over the years it has benefited all groups in our society. But it is important to understand that, in broad areas of action, the law is far from a clear guide.

The Sherman Act, which has cast a long shadow over American industry for seventy years, has worked mainly as a kind of enabling legislation. As our company's general counsel explains it, the Act has allowed "judges—in the particular economic and social climate of their days—to apply the brakes to a course or trend of conduct that, in its context, looked unhealthful. Antitrust laws in America are never in a state of being; they are constantly in a process of becoming. You can never close the book and say that now we know what we cannot do."

Thus business must often act in a legal no-man's land, moving on the advice of counsel—if indeed it is

*Industry* (June, 1961), *Associated Industries of Massachusetts*.

aware of the need for counsel—and not knowing whether at some future time it may be found in violation of antitrust or other laws.

#### **Crime—or Confusion?**

Whenever you are hailed into court or asked to testify before a committee of Congress, the popular supposition is likely to be that you are up to no good, probably guilty of willful wrong-doing, and very possibly a bunch of crooks.

Great caution should be exercised by the courts, legislatures, and press—particularly in vague areas of antitrust and monopoly—to let it be understood that the mere fact that you are sued, investigated, or even indicted—or that a Congressional committee disagrees with how you price your products—does not necessarily mean that you are crooked, unethical, or even wrong. A distinction should be made between the obviously criminal situation and that in which the court's purpose is to define, clarify, or correct a situation. Otherwise, irreparable harm may be done to ethical firms and their managements, acting to the best of their understanding within the law and in the best interests of stockholders and the public at large.

#### **No Loophole**

This does not mean, however, that business has a loophole through which to escape the requirement to deal fairly and ethically. There is

one and only one way for business to keep its skirts clear; that is to insist that top management maintain the highest standards of integrity in all aspects of business operation.

Perhaps more than in any other way, our integrity will be reflected in the products we offer. I believe today, more deeply than ever before, that the future of industry depends directly on our ability to produce products that perform exactly as we say they will perform, products that establish their own standards of integrity—of quality, durability, and dependability.

#### **Borderline Areas**

I would like to suggest that all of us in business management take a new, long look at ourselves and all our business practices. I suggest we look not only at the obvious areas of danger, where we may run afoul of the law, but also at those borderline areas of corporate action that might have unfortunate social consequences for our fellow man.

Obedience to the law is not enough. The law is negative; it tells us only what we must not do. As Crawford Greenewalt, president of Du Pont, has suggested, we in industry must be concerned more specifically with "obedience to the unenforceable . . . the things we do, not because they are required, but because they are right. This strength is more potent and compelling than the law." ♦

# *Is Collective Bargaining Worth Saving?*

**By Selwyn H. Torff**

*Condensed from Labor Law Journal*

THERE IS LITTLE PRAISE to shower either on business management or on union leadership for their current roles in labor-management relations and for the direction in which they are currently leading the collective-bargaining process. Many academicians believe that, despite occasional storms and crises, the collective-bargaining process is really working quite well. It isn't. Cer-

tain unfortunate trends are manifesting themselves:

- *Trend toward public posturing.* Labor and management are making a public spectacle, rather than a private transaction, out of collective-bargaining negotiations. Long before negotiations, union officials are meeting under the spotlight of publicity; formulating and releasing sweeping demands; arguing the



*Labor Law Journal (April, 1961), © 1961 by Commerce Clearing House, Inc.*

righteousness of their position in the newspapers and other mass-communication media; and blaming management for any strike that may occur. With comparable efficiency, management retorts with speeches, press releases, and paid advertisements aimed at the public whose interests, management proclaims, it is determined to protect. And all this occurs before any meeting of the parties has been held.

• *Trend toward inflexibility.* Collective bargaining is steadily losing its resiliency and flexibility. It has become rigid, doctrinaire, and overinstitutionalized. There is too much talk of "this pattern" or "this policy" at the bargaining table. Too little discretion is being left to those sitting at the bargaining table to work out solutions tailored to the problems confronting them.

• *Trend toward overemphasis of economic force.* In our economy, there is an increasingly large concentration of industrial power on the one side and of union power on the other. Thus there is less and less likelihood that economic power can settle an issue on which both sides are equally determined. It becomes, rather, increasingly likely that the issue will have to be resolved through some device other than the traditional processes of collective bargaining—particularly when the dispute causes serious harm, or even marked inconvenience, to a sizable segment of the public.

• *Trend away from collective bargaining.* The seeds of third-party determinism are being sown in the various ideas advanced concerning national-emergency strike legislation: proposals for fact-finding boards with power to make recommendations; for boards of inquiry to pressure the parties into "voluntary arbitration"; for extended use of the injunction; and for government seizure of industry, with the government instituting changes in wages and working conditions during the period of governmental operation.

The assumption underlying national-emergency strike legislation is that labor and management will not, by their own actions, place the national interest above their own immediate interests. This is no vote of confidence in the collective-bargaining process. The fateful last step of the national-emergency-dispute procedure of the Taft-Hartley Act—submission of the matter to Congress with Presidential recommendations—has never been resorted to. It is sobering to contemplate what the results of taking this step might have been or might be.

#### **Basic Questions**

What was once regarded as unquestionable is now being openly questioned: Is the collective-bargaining process worth preserving from the standpoint of national interest? Can it be preserved? The answer to both questions is a quali-

fied "yes." It is worth preserving and can be preserved only if the leaders of organized labor and of industry are willing to begin, before it is too late, to turn the collective-bargaining process sharply away from the direction in which it is now headed. There must be an end to public posturing; collective bargaining must be taken out of the newspapers and confined to the bargaining table. There must be an end to emotion-charged partisanship; definite steps must be taken toward more objective weighing of issues. There must be an end to uncompromising militancy on the one side and to sterile negativism on the other.

#### ***A Change of Climate***

The collective-bargaining process also needs a change of climate in which it operates. Channels of communication between representatives of union and management must be opened up and used. With too few exceptions, management and union leaders meet only to negotiate contracts, or to process grievances, or to try arbitration cases, or to put out fires. When they meet under other circumstances, it is generally to debate before a public gathering on some specific issue, with each side proclaiming the virtues of its position and castigating the position of the other side. Obviously, these media do not lend themselves to narrowing the area of misunderstanding.

We need, in all industries where the collective-bargaining process operates, meetings at high levels of union and management leadership; meetings that are the parties' own private business, removed from the glare of publicity and the pressure of press, radio, and television; meetings without transcripts, without government representatives or sponsors, without rigidly formal agendas, without preconditions attached; meetings at which the participants come prepared and willing to listen as much as to talk; meetings in which the problems, plans, and objectives of each party are candidly explained, discussed, and given respectful and constructive consideration. If approached by the parties with the realization that the fate of the collective-bargaining system is at stake, such meetings could accomplish much to improve the climate of labor-management relations.

#### ***Two-Way Communication***

There are other ways to open up the channels of communication between union and management leadership. It would be a healthy development if unions regularly invited management spokesmen to address their conventions, assuring them a courteous reception. The delegates at union conventions ought to hear the viewpoints of the men who employ their members. Similarly, management groups could profit by regularly inviting the leaders of the

unions that represent their employees to address their meetings—again, assuring a courteous reception.

We do send students, teachers, artists, scientists, and engineers to foreign countries to improve the climate of international relations and promote better understanding between peoples whose beliefs, customs, ideals, and methods are different. This type of approach might beneficially be applied to our trou-

bled labor-management relations.

In our time, union leadership and management leadership are summoned to responsibility. If they fail to heed this summons, they bring closer the day when they will be directing their respective contentions on wages, hours, and employment conditions, not to one another across the bargaining table, but to someone seated at the head of the table with the authority to decide these matters for them. ♦



"I had to leave the last place—the boss went on a production kick."

# *Stockholders— Allies in Marketing*

By **Etna Kelley**

*Condensed from Sales Management*

CUSTOMER LOYALTY and word-of-mouth advertising are among the marketing goals of every organization. Yet, in their attempts to reach these goals, a surprising number of companies fail to enlist a forceful group of allies: their own shareholders. Each day, thousands upon thousands of company owners blithely buy, use, and "talk up" the products of companies in competition with their own.

Corporate managements seldom try to do anything about this situation. Why? More often than not, it's because "shareholder relations is a Finance problem and sales are up to Marketing."

Shareholders, because of their interest in the company they partly own, offer a receptive, prime market. And they're easy to reach: Most companies have to communicate with their shareholders four or five times a year about financial matters, and any additional promo-

tional material gets a free ride. Moreover, a shareholder is more likely to open and read a letter from "his" company than from an unfamiliar source.

#### **Owners Can Be Customers**

Several companies actively enlist their stockholders' patronage. The Borden Co. is one example. This comment, by Borden President Harold W. Comfort, appeared in a recent quarterly report to shareholders: "You may rightfully feel that management should not bother shareholders with problems of sales promotion, and I would certainly agree that stock ownership carries no obligation to help along a company's business. However, I would not be fulfilling the trust that you have placed in management if I did not attempt to direct the frequently expressed enthusiasm for Borden products into channels that would be most beneficial to our company."

*Sales Management* (April 7, 1961), © 1961 by *Sales Management, Inc.*

I hope that those of you who agree with me will continue to buy Borden's, to boost our products to your friends, and to indicate your preference to your own grocer." Borden regards the stockholder list of 48,954 people (end of 1960) not as a group of individuals but as families—families which, with the national average at 3.7 persons each, comprise an interested market slightly larger than the population of Hartford.

#### **Showcase for Products**

Borden uses its annual reports as a showcase for its products, and usually features recipes built around the company brand. Quarterly stockholder memos often feature products, too, and a recent one included a copy of a handbook with tips to the do-it-yourselfer on using the company's adhesive product.

Product sampling to shareholders is used extensively. The meal served at the latest annual meeting consisted entirely of Borden products. At times, samples are offered through quarterly memos to inform stockholders about new products and to urge them to try them and pass the word. Every fall, the company offers stockholders a selection of holiday gift packages at attractive prices. In 1960, the items were a five-pound cheddar cheese, a variety assortment of party foods, a jar of brandied mincemeat, and a kit of the company's brand of cosmetics.

A company like General Motors

must, of course, refrain from offering samples, but in its own way it also solicits loyalty from its stockholders. The appeal begins as soon as a new shareholder buys his stock. He receives a welcoming letter from the board chairman listing the company's leading products by brand names. The letter includes a strongly implied bid for patronage.

Four times a year, when the shareholder removes his dividend from the envelope, he sees behind the window the slogan, "GM is Your Company—Buy and Boost GM Products." Both annual and quarterly reports feature write-ups and photographs of products. The annual reports display products with color photographs and gatefolds.

#### **Sales Literature**

Booklets and other sales literature go regularly to shareholders, sometimes along with the annual report or quarterly statement, and sometimes separately. Last year, for example, a Frigidaire appliance booklet was sent with the first-quarter report. And right after the last '61 model car was introduced last fall, a special booklet with product descriptions and prices was addressed to each stockholder. At annual meetings, GM products are displayed and demonstrated, and shareholders present are given the opportunity to test-drive one of the newest models around the test track.

National Biscuit Co. also uses the welcoming letter to new share-

holders, and it minces no words in its request for support. One paragraph reads: "As you know, dividends depend on sales—and sales depend on customers. We currently manufacture over 175 cookie and cracker varieties in addition to allied products, and we like to think that every person in our country is a customer of ours. Presumably, as a shareholder, you like our products and we hope you will recommend them to your friends."

Additional sales material is included with the president's letter to the new owners. An accordion-fold brochure telling of current operations, outlining the company's history, and mentioning some of the more popular products is one of the promotion pieces. A glossy proof of an ad for a new product may also be included.

#### **Financial Reports**

Financial reports carry their weight, too. The current annual report has a center spread showing 62 products in full color, and elsewhere it pictures new products over mouth-watering descriptions of each.

Even though quarterly reports do not always include product promotion, special circulars featuring one product in illustrations and text are mailed in the same envelope. The summer dividend check was accompanied by a leaflet showing several Nabisco hot-weather snacks.

The cost of mailing the com-

pany's fragile, semi-perishable product has discouraged Nabisco from giving away products to shareholders except at annual meetings. Like Borden, Nabisco offers a Christmas gift package.

#### **Welcome Sample**

One of the companies most heavily involved in shareholder sampling is Bristol-Myers. Each new stockholder receives, along with a welcoming letter which bids for good will and support, a gift package of the company's nonprescription products. By attending the company's annual meeting in New York, the shareholder can get another gift package as well as a number of individual samples from a variety of display booths.

Bristol-Myers uses its financial statements to keep stockholders interested between samples. The annual report features a division-by-division breakdown of products which are illustrated with color photographs. Quarterly dividend checks are accompanied by folders illustrating the latest new product or development.

The stockholder promotion campaign is not necessarily limited to consumer-goods companies. Pitney-Bowes, for example, includes a postpaid reply card in its annual report. Shareholders can use the card to request product literature or a demonstration. There is also a place on the card for prospects' names. ♦



# Seven Ratios for Materials Handling

*Condensed from The Iron Age*

ONE METALWORKING PLANT recently computed the hours consumed by each of its major production operations. The figures showed that twice as many hours were spent on materials handling as on the second most active operation in the plant.

Materials handling must be made an efficient operation in every plant. It can be done in yours, too, and the ammunition you need is right in sight. A manager can jot down the data you need during a tour of the plant. These data can then be worked into simple ratios, which can tell you which areas in

your materials-handling system need updating. The ratios were created jointly by J. R. Bright, director of the Industrial Management Center, Lake Placid, N. Y., and the Yale Material Handling Division of The Yale & Towne Mfg. Co., Philadelphia.

#### **Materials-Handling Labor**

The first ratio deals with the size of materials-handling operations in your company. To determine this, first compute the total wages earned by workers who are employed entirely in moving materials. Many other workers, of course, handle

*The Iron Age* (June 29, 1961), © 1961 by Chilton Company.

materials from time to time. You can include a realistic portion of their wages in your figure.

Once you get a total of both full-time and part-time wages, divide this sum by the total wages of the whole work force. This will give you the materials-handling labor ratio.

Certain companies are bound to have higher ratios than others. In metalworking, for example, a labor ratio of 40 per cent would be extremely high; 5 per cent would be very low. If your ratio is 20 per cent, there might be room for improvement. An ideal ratio might be 10 per cent.

A manufacturer of oil-well equipment has already put this ratio to the test, and showed savings of \$18,000 in one year solely in the shipping and the inspection of bar stock. An electronics company found that 56 per cent of its payroll in thirteen plants went for materials handling. An aggressive attack on the causes reduced the figure to 25 per cent. Remember—as these companies did—that the ratio serves merely as a starting point for positive action.

#### **Direct-Labor Handling Loss**

Are highly skilled workers ignoring their main jobs to move materials? If so, it may be because handling techniques and equipment are not up to par. To find out, compute the materials-handling time spent by direct labor, then divide this figure by the total direct-labor

time. If your answer is 15 per cent or more, it's a warning that your direct-labor handling time is getting high.

#### **Movement/Operation**

The third ratio permits management to see whether there are too many handling actions. This figure is obtained by dividing the total number of moves by the total number of productive steps. How many operations are required before an item is processed through the plant?

The work place can be a key problem spot. Here materials are picked up and put down several times. At stations where a sequence of work tasks is done, much unnecessary handling often occurs. Another trouble spot is the end of a mechanized production line. Don't overlook temporary delays. They can cause unneeded movements. And don't omit some movement just because it's mechanized.

On this score, a 4-to-1 ratio is a good target for a job shop. Conveyorized systems should shoot for 3-to-1, or better.

#### **Manufacturing-Cycle Efficiency**

Plant management must know how effectively the production system executes the manufacturing order. This is called manufacturing-cycle efficiency, and is obtained by determining the sum of all production-operation cycle times, and then dividing this figure by the elapsed time in the production system.

There are many factors which cause low cycle efficiency. Where work piles up at a machine station, can added equipment be installed to relieve the bottleneck? Are the materials traveling too far? If they are, perhaps a few changes in plant layout might solve this problem. Check into communications, too. Materials may be delayed because paper work is late. Sometimes a major cause of delay can be traced to one department or machine.

#### **Space Utilization**

The fifth ratio measures how effectively your enclosed space is used. To compute it, divide the cubic footage now in use by the potential amount of usable space. Naturally, such areas as columns, stairwells, and clearances in front of doorways and docks must be deducted from potential usable space.

A 60 per cent space-utilization efficiency for a warehouse is good. Of course, this figure will be lower where quantity of each item is small and many items involved.

#### **Equipment Utilization**

Management always wants to know whether a costly machine is running efficiently. The best way to find out is through the equipment-utilization ratio. It's computed by dividing actual output by theoretical capacity. ♦

Prime targets for this ratio are machines that are major factors in production activity, those marked by heavy investments, and those causing bottlenecks. Hours should be compiled over at least a day, and preferably a week.

Before automation, an auto plant would hit about 60 per cent. With automation, engine plants moved up to around 80 per cent. Some steel mill rolling plants are up to 85 per cent. Job shops, however, often drop to 40 per cent.

#### **Aisle Space**

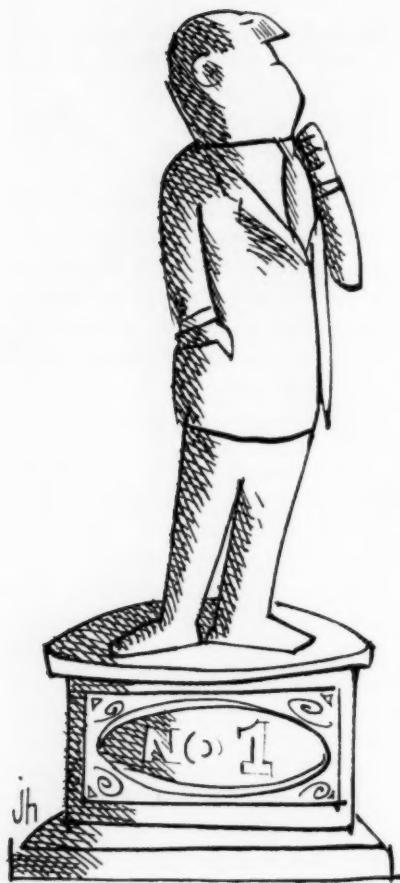
The final ratio takes up the problem of wasted aisle space. First, determine the current aisle floor-space; then, from this figure, subtract the theoretical optimum aisle floor-space. Divide your result by the current aisle floor-space. In some plants, increases of 40 per cent more productive space were picked up from wasted aisle space alone. Perhaps improved materials-handling equipment would allow for narrower aisles. Check, too, to see if the aisles are in the right places. And how many unnecessary ones are there?

These seven ratios, taken together, can reveal the trouble spots in your plant. Once you have the figures, then it's time to apply corrective measures to increase efficiency. ♦

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MINDS ARE LIKE PARACHUTES—they function only when open.

—Lord Thomas Dewar

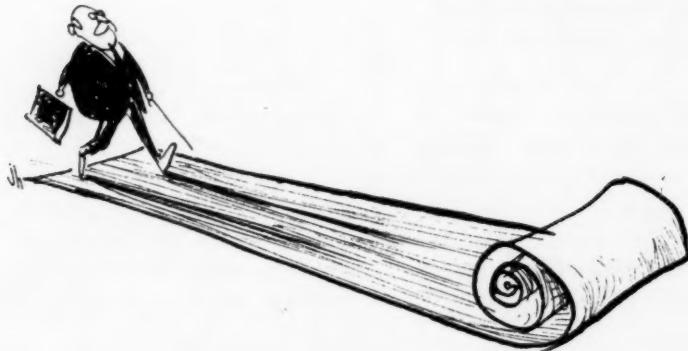


## The True Executive

*By Richard Armour*

From what I've read in magazines  
And seen in sundry movie scenes,  
The true executive is he  
Who delegates authority,  
Who resolutely, firmly acts,  
But only when he has the facts,

Who speaks well, writes a splendid letter,  
But also listens even better,  
Who cares about his men, their wives,  
But doesn't meddle in their lives,  
Who knows details, yet keeps his eye  
On goals beyond minutiae,  
Who works as long as anyone,  
And leaves his desk clear, tasks all done,  
Who even on the darkest days  
Can summon up a word of praise  
And bravely smile amidst disaster,  
Who goes to church, and knows the pastor,  
Who chairmans P.T.A. and Chest,  
Who, hale and hearty, needs no rest,  
But is, of course, a sportsman too,  
Topnotch with golf club, gun, canoe.  
The true executive, in short,  
Is good at work and good at sport,  
Resourceful, charming, man of talents,  
Possessed of perfect poise and balance,  
His words and deeds and aims all mesh . . . .  
I'd like to see one in the flesh.



# THE ELEMENTS OF Capital Investment

By John W. Hackney

Condensed from *Chemical Engineering*

ONE MAJOR OPPORTUNITY for improving profits presents itself when a company is considering new capital investments. Here is where mediocre and poor projects, from an investment standpoint, can be eliminated promptly, and where good projects should be confidently identified and pushed to early completion.

Computing actual investment in a large project is not a simple matter. Many factors must be considered if forecast profitabilities for various proposed projects are to be comparable.

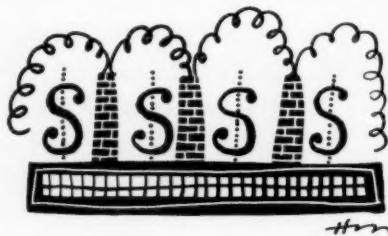
## Three Views

Investment in a major project should be appraised in three ways:

- The long-term view involves determining the project's gross investment—the value of all company resources devoted to the project. It

includes not only funds directly expended for construction, but also the value of items already owned and transferred to the project's use; operating costs directly related to construction; funds to be tied up in working capital; allocation of general facilities and utilities serving this and other production units; the value of installations destroyed because of the project; and a reserve, which may or may not be used.

- Immediate dollar commitments—the project's cash requirement—are usually less than gross investment. For example, some necessary equipment may be already on hand and usable without cash outlay. You may not have to provide new cash to build roads or other general facilities, even though the project cannot function without them. However, a particular project may trigger an



*Excerpted with permission from Chemical Engineering (May 15, 1961), © 1961 by McGraw-Hill Publishing Co., Inc.*

unavoidable cash requirement for a new boiler or set of pipe-racks that could not, in fairness, be charged entirely to the project's gross investment. Cash requirement, therefore, may sometimes be greater than gross investment. This figure is used primarily in the planning for capital funds.

• The third view involves that portion of the total investment that can be effectively recorded and controlled by those responsible for carrying out the project. This appropriation amount includes direct investment; operating expense that will be charged to the appropriation; book value of items transferred for the project's use; cash to be spent for utilities and general facilities; and similar items. It does not include tax credits, working capital, or allocations, since these are usually outside of the control of the project group.

#### **Battery Limit**

"Battery limit" is a term used in segregating direct investment from supporting investment. It is an imaginary, continuous line surrounding any project that encloses and lies at least ten feet outside of all buildings, structures, equipment, roadways, and other facilities dedicated to its sole use. In general, this line will parallel main roads, railroads, plant-boundary fences, and natural terrain features.

Direct capital investment includes all capitalized expenditures for in-

stallations within the project's battery limit. In addition to the more obvious items, it includes:

- Value of store items that must be replaced for stock.
- Cost of detailed design and field supervision by outside engineers.
- Cost of detailed design and field supervision by company engineers for major new facilities. Major facilities usually involve more than \$100,000 in direct capital investment, exclusive of engineering.

#### **Supporting Utilities**

Supporting utilities are those serving a project but lying outside its battery limits. They serve, or are planned to eventually serve, more than one project.

Supporting-utilities investment is not normally included in gross investment. If actual supporting-utility investment is required, its cost is included in cash requirement and in the appropriation amount. This provides a basis for cash-requirement planning and for control of progress and costs on this portion of the program.

#### **General Facilities**

General facilities, which also lie outside of a project's battery limits, support or are planned to eventually support more than one production unit. They include cafeterias, offices, parking lots, personnel buildings and equipment, and similar services. When a project is served by existing or proposed general facilities, a cap-

ital allocation is included in gross investment for the new project, to cover use of these items.

#### **Operating Expense**

Operating expense, as used in investment computation, includes any extra operating dollars spent on constructing and starting up the project. Some typical operating-expense items are site clearing; temporary process connections and enclosures; repairing, relocating, and reconditioning existing structures; and start-up costs. Also to be considered are extraordinary production and sales costs; preliminary project engineering; and detailed design work by company engineers for minor modifications.

#### **Forced Retirement**

Forced retirement of facilities from company service because of an upcoming project influences overall investment. Any real value destroyed this way is charged to the project's gross investment. The normal amount is the depreciated investment or book value destroyed, including residual installation value. A credit is allowed for conservatively estimated resale or scrap value, which may occasionally exceed book value.

Book value is normally assumed to represent the actual worth of items. It is reasonably easy to determine, and accurate enough for most situations. In special cases where obsolescence or deterioration has

abnormally reduced the value of retired items, or where circumstances have made their actual dollar worth substantially greater than book value, destroyed value should be reappraised. One measure of actual value is the present, or reasonably probable, net income after taxes from the existing unit, capitalized at, say, 6 per cent. Another measure is sale value to an outsider.

Value of retired facilities destroyed is not included in cash requirement for a project, since no expenditure is involved. The cost of dismantling and removing is included in operating expense. Salvage expected from the sale of retired facilities is handled as a credit to cash requirement.

#### **Tax Credit**

Tax credit is the amount that income tax is reduced because of any retirement losses or special operating expenses incurred in connection with the project. Credit for most corporations is assumed to be 52 per cent of operating-expense items, plus tax credit for the loss on items physically retired because of the project.

#### **Working Capital**

Working capital is one of the more subtle elements of capital investment and probably the one most easily overlooked. It consists of money and goods that must exist in an organization at any given time to enable it to function. Working

capital chargeable to a given project is the net increase (or decrease) in the working capital of the whole corporation due to addition of the project. Working capital includes process inventories; supplies inventory; accounts receivable; current liabilities (a credit); and other current assets.

Process inventories include inventories at estimated cost—or transfer price if from another company division—of raw material; in-process material; finished product in storage; product en route to customers, but not billed; product in customers' or retailers' hands on consignment; stored fuel; and stored packaging material.

Any one of these items may either be small enough to ignore or large enough to be a major investment item for the project. Inventories deserve special attention when seasonal, high-value, or bulk-shipment materials are involved. In such cases, it is a good idea to make a complete analysis of the inventory situation, considering expected production, shipping and sales fluctuations, and the inventory required to

meet them. Successful computation of these costs often requires the joint efforts of sales, operating, purchasing, traffic, and accounting departments.

#### **Rights and Reserve**

Other important items to consider may be single-sum process or know-how rights, major uninstalled spare equipment or parts (over \$1000 per item), and other items of gross investment required for the project's success.

A final item—reserve—is an amount by which the project may overrun if a great many things go wrong. It is computed on a percentage basis, proportionate to the degree of novelty of the project and the extent to which project investigation and engineering have been completed.

In no case should the reserve be less than 15 per cent of the sum of the other items of gross investment or cash requirement. Projects so sensitive to capital investment that they will be unattractive if they have an overrun of 15 per cent are usually not justifiable. ♦

### **Corporate Contributions—Where They Go**

U.S. BUSINESS CONTRIBUTED 420 million dollars to support national and community nonprofit causes in 1960, according to an estimate of the American Association of Fund-Raising Counsel, Inc.—as reported in *Administrative Management*.

Approximately 49 per cent of all corporate support went to health and welfare causes, 34 per cent to education, and the rest to cultural and business purposes. Corporate gifts accounted for 35 per cent of the total contributions to United Fund and Community Chests.

## Tourism—Our Homemade Pie

THE BIRTHPLACE of the cowboy, the Indian, and the skyscraper is putting forth its wonders to tempt those living abroad, reports *The Biddle Survey*. Recent word from Washington is that the government is easing its defenses to encourage an invasion from across the sea. Joining a host of other travel-sellers, the U.S. itself will now spend several million dollars to reach travelers in Europe and elsewhere with the message that the U.S.A. is nothing less than a tourist's paradise.

This expanded promotion, which will be under the auspices of a new tourist office in the Department of Commerce, offers dynamic recognition that tourism has become a bona fide industry. And, like all industries, it touches many other aspects of business. In the words of Secretary of Commerce Luther H. Hodges:

"It includes the restaurants and hotels that feed and lodge travelers. It includes the steamship, airline, railroad, motorbus, and streetcar companies that carry the travelers. It includes travel agents, sightseeing companies, auto-rental agencies, advertising agencies, shopkeepers, and many others. Travel is an industry not because its members produce similar products or provide similar services, but because they share the same customer—the traveler."

The implications for businesses of all types are quite promising when one considers that the average European visitor now spends \$500 in the U.S. for various goods and services. Last year, about 280,000 Europeans visited this country. The government's aim is to double that figure within four years.



"Please—my Blue Cross just ran out!"

**A feasibility study can help management to avoid many of the pitfalls in proposed new projects . . .**

## **Check List for New Business Ventures**

*Condensed from Industrial Development and Manufacturers Record*

**H**OW CAN YOU TELL whether a proposed business venture will be successful? There is no sure way, of course, but many business managements are turning to a tool that is designed to reduce the guess-work involved in industrial projects

of all kinds. The tool is the feasibility study: a beforehand, systematic analysis of the economic and technical aspects of a corporate venture.

Recently, the Office of Industrial Resources in the International Co-operation Administration published an outline of a typical feasibility study. Although the ICA check list was designed for an evaluation of overseas projects, it is also applicable, in large part, to domestic ventures. The following excerpts—pertaining to the launching of a new product—suggest how the check list, together with expert advice, can help management avoid some of the pitfalls which often plague new projects.

### ***The Markets***

Management should determine the answers to these questions concerning the markets for a proposed product:

***The Domestic Market:*** Is there already a demand for the product? Who are the principal consumers? How is the demand for the product now satisfied? By local production? If so, what is the volume of annual production? What percentage of consumption is filled by local production? What per cent by imports? What is the volume of annual imports? From what areas are they derived? What is the estimated annual increase in local consumption?

Would the estimated sales price

*Industrial Development and Manufacturers (April, 1961),  
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and quality of the new product make it competitive with an imported equivalent? After management adjusts cost to local conditions, is the estimated sales price of the product so high that tariff protection is necessary to protect it from importers?

Are there any significant consumer prejudices against local products that could not be overcome by assured quality of product?

If they could be overcome, how could this be done? How heavy would the cost for this be? For how long?

*The Export Market:* Could the product compete in export markets on the basis of price, quality, and dependability of supply? Can export markets for the product be developed? If so, in what areas and in what annual volume? What procedures would be necessary to develop export markets? What would this task cost?

#### **Sales and Distribution**

In calculating costs of the product, has management made adequate allowance for the expense of a sales department and the advertising and promotion that might be required? Do marketing and distribution facilities for the product exist? If not, can they be set up? What would it cost to do so? Will the product be sold to: Wholesalers? Retailers? Direct to consumer? Government?

#### **Financing**

Has a definite plan to finance the project been worked out? Will sufficient capital be available? If not, what is the plan to obtain it?

In calculating cash-flow and working-capital requirements, has careful consideration been given to maintaining adequate inventories of raw materials? Supplies and spare parts? Seasonal fluctuations in demand? The time required to liquidate credit sales to customers and bad debts? The time necessary to get the plant into production?

#### **Costs**

If the economy is in a period of inflation, has full allowance been made for the influence of rising prices and wages on the cost of the project and on working-capital requirements?

If new facilities are needed, has careful consideration been given to: The effect on costs of delays in construction schedules? Delays in delivery and installation of new machinery and equipment? Time lapse involved in obtaining essential raw materials and supplies?

If new machinery or equipment is required, were competent advisors consulted in its selection? Was full consideration given to comparable costs of machinery available from other suppliers? Was there adequate provision for assuring comparability of estimated costs in terms of quality, capacity, and serviceability of the machinery or

equipment? Has full study been made of the credit terms proffered by alternative suppliers?

#### **Patents and Royalties**

Has appropriate attention been given to patents, tradenames, and royalty considerations? Must the right to manufacture the product be obtained from a patent holder on a royalty, a fee, or a licensing basis? What will be the costs and operating advantages or disadvantages of such arrangements, on the basis of

a unit-royalty or a fixed-sum payment?

Will there be gains in sales resulting from advertising and distribution of the product under the tradename of a company with an established international reputation, especially for "quality" or "style" products? To what extent will there be specific advantages (or disadvantages) of drawing upon the patent or tradename holder for partnership in management and/or for technical advice and guidance? ♦

#### **Directors' Tenure**

AGE AND ABILITY to contribute to the company are the principal considerations that limit a director's length of service, according to a survey of 205 U.S. manufacturing firms released recently by the National Industrial Conference Board. While many of these companies have adopted compulsory retirement plans for their boards, the majority of them place no formal limits on the tenure of their directors and do not encourage changes in board membership.

Approximately 60 per cent of the respondent companies state that they have no formal policies or established practices regarding directors' tenure. Among factors most often mentioned as influencing a company's attitude toward a director's tenure are the firm's relative success in maintaining an active board, the size of the company, and the nature of its ownership.

A director's sustained and effective participation in company affairs is the most important influence on his continuation in office, say almost all those companies that discussed the factors determining a director's length of service. This same consideration seems to be given as much weight by those companies that place formal limits on their directors' services as by those that do not place such limits.

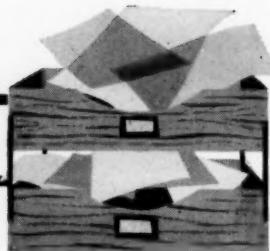
The average tenure of the boards of individual companies reporting on this matter varies from four to thirty years, the NICB survey finds. In two-thirds of the companies, the average is between eight and fifteen years, inclusive. Most of the companies reporting the lowest-average figures explain that they have recently added unusually large numbers of new directors.

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## ALSO RECOMMENDED

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*summaries of other timely articles*



### GENERAL

**REGULATION BY ELEPHANT, RABBIT, AND LARK.** By George Bookman. *Fortune* (Time & Life Building, Rockefeller Center, New York 20, N. Y.), June, 1961. \$1.25. "An administrative agency is a hybrid, indeed a monstrosity . . . part elephant, part jack rabbit, and part field lark," according to a quote in this investigation of the seven major "independent" government agencies that regulate business. The hybridization results from responsibilities that are in conflict: Agencies must perform as judges and obey legal norms, be makers and flexible administrators of policy in the constantly changing business world, and fly blind in their relationships both with the industries they regulate and with other federal units.

**MAKE SHELF-SITTERS AN ASSET.** By Dr. Eugene Emerson Jennings. *Nation's Business* (1615 H Street, N.W., Washington 6, D. C.), May, 1961. Reprints 10 cents. Men who temporarily or permanently stop climbing up the ladder are divided into four groups in this article, which deals with how to recognize and understand them. The four groups are (1) good men who do not want to rise above the present job and lack the ability to do so; (2) satisfied men capable of rising higher, who want to rest

on the shelf; (3) men at the ceiling of their capacity who are unsatisfied on the shelf; and (4) able, unsatisfied men who have been put on a temporary shelf made by management for reserve purposes.

**SHIPPERS: ROLLING THEIR OWN PAYS OFF.** *Dun's Review and Modern Industry* (99 Church Street, New York 8, N. Y.), June, 1961. 75 cents. While the nation's railroads, trucking companies, airlines, and barge fleets have been battling with each other over the 50 billion dollars spent for freight transportation each year, company-owned and company-operated trucks have been taking an ever-larger chunk of the business. This article analyzes causes, effects, and extent of the inroads private trucking has made on the business and discusses the relationship of the ICC to both regulated and unregulated trucking.

**THE TOP TEN PLANTS OF 1961.** *Factory* (330 West 42 Street, New York 36, N. Y.), May, 1961. \$1.00. From more than 500 new factories throughout the 50 states, the top ten plants have been selected and are reproduced in color photographs in this article, which includes an engineering fact file giving a detailed, precise examination of what the

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plants are like, how they're built, and why they're good. A statistical check list that includes everything from floor covering to roof insulation, bay size to bus

duct, and cafeterias to craneways may be used as a source of ideas for plant men, regardless of the size or age of the plant they work in.

## PRODUCTION

**MATERIALS FOR THE FUTURE.** By C. L. Kibrin. *The Iron Age* (Chestnut and 56th Streets, Philadelphia 39, Pa.), June 22, 1961. 50 cents. For the metal-working designer and manufacturer, there will be an endless variety of new materials in the 1960's, including computer-designed alloys, ductile ceramics, and heat-resistant plastics, according to this article, which charts the future of materials and prophesies that by 1970, materials will no longer be classified as metals, ceramics, glasses, and polymers, but instead will be organized by use—such as structural, nuclear, magnetic, electrical, and optical. Trends are reported toward refinement of standard techniques, increased emphasis on the more advanced fabrication and joining concepts, more precise instrumentation, and more stringent quality control.

**A GUIDE TO TOOL STEEL & CARBIDES.** *Steel* (The Penton Building, Cleveland 13, O.), May 15, 1961. Single reprints \$1.00. Designed as a source to aid in the selection of material for tooling jobs or for critical structural applications, this 48-page guide contains more than

1200 different tool steels, carbides, and ceramic materials produced by 79 companies. For each material, it lists the supplier and his address, suggested applications, and (where appropriate) chemical compositions and heat-treating information. In addition, there is a breakdown of primary applications; under "high stress and high wear machinery parts," for example, are found chuck jaws, clutch pins, drill bushings, and mandrels, among others.

**STEPPINGSTONES TO NUMERICAL CONTROL.** By Nils O. Olesten. *Automation* (Penton Building, Cleveland 13, O.), June, 1961. Single reprints gratis. Dealing primarily with continuous-path numerical-control machine-tool operation as applied to two-dimensional and three-dimensional parts, the author discusses the development of the method, its applications, and results to date. He then takes up particulars to be considered by a company undertaking numerical control, including equipment selection, the relative merits of programing services and in-plant programing facilities, department organization, and costs.

## FOREIGN OPERATIONS

**MIRACLE MARKET ON THE RHINE.** By Roland Mann. *Dun's Review and Modern Industry* (99 Church Street, New York 8, N. Y.), July, 1961. 75 cents. Giant of the Common Market, with its fastest-growing and most productive economy (GNP last year topped 65 billion dollars), West Germany has be-

come a mecca for U.S. marketers, especially industrial equipment producers, according to the author, who cites American machinery at work in Volkswagen plants and a 41 per cent production expansion in Ford Motor Co.'s Cologne subsidiary. And even though an acute labor shortage is troublesome for U.S.

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producers there, it has a silver lining for some manufacturers at home: As the manpower vise tightens, computers are moving in to handle paper work, and German imports of U.S.-made automatic equipment are soaring.

**REFRIGERATORS TO MOSCOW.** By Sandford Brown. *Newsweek* (444 Madison Avenue, New York 22, N.Y.), June 5, 1961. 25 cents. Although the thought of trading with the Communists often arouses violent emotions, many businessmen, especially among our European allies, find that it can be done safely and profitably, according to this article, which examines pros and cons of swelling East-West trade. Some barriers for U.S. businessmen are outright legal restrictions; the Communist custom of exporting only what is surplus to their controlled economic plans, and their preference for importing technology

rather than products; and the fact that the East doesn't have enough of what the West wants in order to accumulate the currencies it needs to buy Western goods. On the brighter side, the Russians have begun to buy patents and pay royalties for use of valuable processes and generally honor their contracts.

#### **WORLD TRADE REVIEW AND OUTLOOK.**

*Foreign Commerce Weekly* (Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.), May 1, 1961. 15 cents. This 48-page supplement reviews economic developments in the last half of 1960 and examines prospects in 1961 for individual countries of interest to U.S. traders and investors. It covers Africa and 44 countries in Western Europe, the Western Hemisphere, the Near East, and the Far East and Oceania. Generally, the outlook is good, with a few exceptions.

#### **OFFICE**

**CAN A COMPANY LIBRARY SAVE MONEY, TIME, AND WORK?** *Management Methods* (22 West Putnam Avenue, Greenwich, Conn.), June, 1961. Reprints 50 cents. Are company libraries frills or necessities? Should your company have one? This article answers these questions and gives procedures for setting up a company library as well as the specific costs involved. It discusses in detail these advantages of company libraries: (1) They provide a convenient, inexpensive source of practical information; (2) they cut costs by eliminating duplication of research efforts; and (3) they often eliminate the need for a costly outside research project.

**INTERNAL COMMUNICATIONS, 1961.** By Lawrence Victor. *Administrative Management* (212 Fifth Avenue, New York 10, N. Y.), July, 1961. 45 cents.

If time is money, then an effective intercom system to replace memos, messengers, leg work, and backed-up switchboards is no luxury, maintains the author. Included in this discussion of how to choose and install an intercom system and the types that are available is a two-page chart that lists systems by model, manufacturer, manufacturer's address, type (telephone, paging, amplifier, or facsimile), dimensions, station capacity, sales or lease arrangements, and features.

**THE "FUNCTIONALINE" ORGANIZATION PLAN.** By Harold B. Wilson. *The Office* (232 Madison Avenue, New York 16, N. Y.), July, 1961. \$1.00. After pinpointing deficiencies in three traditional types of organization—namely, the line type, Frederick W. Taylor's functional plan, and a combination of

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these called the line-and-staff plan—the author introduces an organizational concept called "Functionaline." Based on the assumption that most office workers can effectively perform different and disassociated tasks if given the opportunity and training, this method involves three

functions for each worker. The primary one is performed under his regular supervisor (who retains *line* supervision); the other two under two other supervisors (who have *functional* supervision) until fresh work for the primary function is again on hand.

## MARKETING

**SIX TIPS FOR BETTER MARKETING IN A FAST-GROWTH INDUSTRY.** By E. Robert Barlow. *Industrial Marketing* (200 East Illinois Street, Chicago 11, Ill.), June, 1961. 50 cents. In a quickly changing field such as electronics, the marketing man must be especially alert and knowledgeable, according to the author, who offers six guidelines for achieving success in such industries. They are: (1) Concentrate on short-term forecasts; (2) put product and market development in the hands of an executive who is business-oriented, rather than technically oriented; (3) develop effective liaison between marketing research and R&D; (4) ask common-sense marketing questions before being swayed too heavily by engineering enthusiasm; (5) don't confuse business and technical know-how; and (6) don't squander fundamental research capability.

**HOW—AND WHEN—TO USE SALES GIMMICKS.** By Stanley N. Arnold. *Management Methods* (22 West Putnam Avenue, Greenwich, Conn.), May, 1961. Tearsheets 50 cents. Gimmicks, used imaginatively to spur sales, are hard to beat, says the author: They are low in cost, they capture wide attention, and they stimulate excitement about a product or service. But, he warns, gimmicks can backfire if a company makes one of three common mistakes: offering inept prizes, timing gimmicks badly, or testing them unrealistically. He offers tips on

how to develop effective sales gimmicks, when to use them, how to avoid common pitfalls, and how to evaluate an idea for a gimmick.

**BUSINESS-PAPER AUDITS: NEW HOPE.** *Printers' Ink* (635 Madison Avenue, New York 22, N. Y.), June 23, 1961. 35 cents. After more than a decade of controversy and study, the Audit Bureau of Circulations and the Business Publications Audit recently started providing complete audits of their members' circulations—both paid and free—according to this article, which hails the action as an encouraging move toward complete comparability of business-paper auditing statements. The next step that advertising men are pushing for is comparable occupational breakdowns of circulations by competing business papers.

**MARKETING PLANNED 5 YEARS AHEAD.** By E. Gidlow. *Sales Management* (630 Third Avenue, New York 17, N. Y.), May 19, 1961. 50 cents. The complexity of marketing decisions that need to be made several years in advance has given rise at Crown Zellerbach Corp. to a department of long-range planning—a vital correlating agency for the marketing planning of a broad line of products. In the form of an interview with the director of the department, this article presents questions and answers covering particulars of the director's job.

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## SURVEY OF BOOKS

for executives



### Executive Pay—the Patton Way

**MEN, MONEY AND MOTIVATION.** By Arch Patton. McGraw-Hill Book Company, Inc., 330 West 42 Street, New York 36, N. Y., 1961. 233 pages. \$7.50.

Reviewed by Robert Newcomb and Marg Sammons\*

Undertaking to tell executives how they should be paid is a bold literary venture, but its hazards have not deterred Arch Patton. In *Men, Money and Motivation*, Mr. Patton—a director of the management consulting firm of McKinsey & Company and a foremost authority on executive compensation—sets forth what might be called, in the spirit of the title, the Patton pattern. Executives may not entirely agree with his ideas, but they will probably read most or all of the book once they start it.

The author makes a thoroughgoing but not oppressively academic attempt to analyze such topics as the best

\* Partners, Newcomb & Sammons, Chicago.

method of determining the worth of an executive, the relative effectiveness of the various plans available, the pricing of the compensation structure itself, and—in one controversial segment—the future of the fringe benefit.

The value of an upper-echelon executive, Patton declares, rests with "the decisions he makes and influences." It doesn't matter whether he reports to the president or to a vice-president, the author insists, and the paper work he processes is not involved in the determination, either. What is important is his contribution to making decisions that "increase or decrease company profits." Patton concedes that this viewpoint may prove somewhat indigestible to the shop-oriented manager, who has been schooled to respect the cardinal principle of job evaluation that the yardstick is the job itself and not the performance of the jobholder.

"The question of what an executive is worth," says Patton, "involves three basic considerations: the size of the company in which he works, the industry, and the importance of his

contribution to the decision-making process." In assessing the effect of the first two on the value of an executive, he notes, the company can obtain much help from compensation surveys. (Here he pays tribute to AMA's pioneering, industry-wide surveys of management compensation.) But, he points out, "there is no easy measure of an individual's contribution to the decision-making process, and this appears to be by far the most important determinant of what an executive is worth."

In examining the growing importance of fringe benefits, Patton acknowledges that the incentive value of cash compensation for executives has been undermined. The development of the various fringes, on the other hand, has been explosive, he says—citing, by way of example, the case of the top financial executive of one large company who was dismayed to learn that his postretirement federal income taxes would be *higher* than the taxes he was paying at the peak of his active career. In exploring the causes of this situation, the executive was reminded that his compensation package included three delayed-fuse fringe benefits: a pension plan that would pay him 50 per cent of his final salary upon retirement, a series of deferred contingent contracts that were to be paid off in the first ten years after he retired, and a contributory savings plan that would pay him a substantial amount of money because of his long service.

The proliferation of such arrangements, Patton thinks, presages an end to the "gimmick" era in fringe benefits for executives. In any case, people

under 50 years of age, he feels, are more concerned about current income that enables them to buy homes, to educate their children, or to invest. He offers a brief evaluation of several forms of fringe benefit—pension plans, profit-sharing trusts, deferred contingent compensation, stock options, and others in the "motivational arsenal."

The administration of executive compensation can be considerably improved by sound performance appraisal, Patton declares, but there are serious pitfalls in the so-called mathematical approach. This is, of course, the approach that attempts to determine individual goals for the year in quantitative terms (for example, increasing sales 10 per cent or cutting scrap losses 7 per cent) and to measure performance in terms of the individual's ability to meet these goals. Instead, Patton recommends the "task planning" concept, which involves four principal areas of appraisal: long-term company objectives, annual company goals, annual functional tasks, and subfunctional goals. He illustrates the concept with a number of hypothetical annual plans that set forth "planned performance targets" for various top line and staff executives.

Patton's style is factual, affable, and lively. He punctuates his more technical explanations with brief case studies that give his conclusions punch and conviction. His statistical material is well presented, and he uses sound communications methods throughout. The hardy question-and-answer technique, for example, is employed in the discussion of incentive plans.

Aside to the company librarian: If you haven't got this book, get it. ♦

## Briefer Book Notes

(Please order books directly from publishers)

### GENERAL

**MANAGERS FOR SMALL INDUSTRY: An International Study.** By Joseph E. Stepanek. The Free Press of Glencoe, Illinois, 119 West Lake Street, Chicago 1, Ill., 1960. 245 pages. \$6.00. This study by the Stanford Research Institute's International Industrial Development Center is concerned with the problem of recruiting and training managerial personnel to build small industry in underdeveloped nations. Drawing on previous studies and on his own extensive experience as an industrial adviser to the United Nations, the U.S. government, and the Institute, the author examines the sources from which entrepreneur-managers develop, the special problems confronting such managers and how they cope with them, and the training currently available to men proposing to enter this field. Detailed suggestions for a three-part training program round off the report.

**ELECTRONIC COMPUTERS AND THEIR BUSINESS APPLICATIONS.** By A. J. Burton and R. G. Mills. Ernest Benn Limited, London. Sole U.S. distributor, International Publications Service, 507 Fifth Avenue, New York 17, N. Y., 1960. 325 pages. \$11.25. An over-all picture of computers and their business applications, designed for the reader with no previous computing experience. Various techniques and types of equipment are discussed and some typical business applications of computers are described.

**PURCHASING DEPARTMENT ORGANIZATION AND AUTHORITY. (AMA Research Study 45.)** By George H. Haas *et al.* American Management Association, Inc., New York, N.Y., 1960. 119 pages. \$4.50 (AMA members, \$3.00). A statistical analysis of purchasing department organization, staffing, operations, and operating expenses, based on questionnaire responses from 147 companies. Besides offering their own explanations of, and comments upon, the survey data, the authors quote extensively from the participants' replies and, in an appendix, reprint a number of job descriptions, organization charts, policy statements, and other material.

**POSTWAR MARKET FOR STATE AND LOCAL GOVERNMENT SECURITIES. (A Study by the National Bureau of Economic Research.)** By Roland I. Robinson. Princeton University Press, Princeton, N.J., 1960. 227 pages. \$5.00. Part of the Bureau's larger inquiry into postwar capital market developments, this report describes and analyzes the operations of this particular market from 1945 through 1956. In considering the change in the market value of tax exemption, it discusses both sources and effects.

**SOURCES FOR THE STUDY OF THE NEW YORK AREA.** By Harold Eiberson. The City College Press, 1960. Available from Associated College Presses, 32 Washington Place, New York 3, N.Y. 128 pages. \$3.75. The aim of

this manual, in the author's words, is to provide "an organized approach to the materials available for reading, study, and research in New York area problems." Business readers may be particularly interested in the chapters on population distribution and composition and on the city's business and economic life.

**FIFTY YEARS PROGRESS IN MANAGEMENT: 1910-1960.** The American Society of Mechanical Engineers, 29 West 39 Street, New York 18, N.Y., 1960. 329 pages. \$10.50. A compilation of ASME's five previously published *Ten Years Progress in Management* reports, together with two more specific papers of historical interest. The 1960 report, considerably more expanded than its predecessors, is composed of articles by more than 20 top-ranking authorities; they deal with the achievements of the past decade in almost all aspects of management—philosophy, education, management as a profession, general management, operational management, and the like.

**TAX GUIDE FOR SMALL BUSINESS.** (1961 Edition.) Internal Revenue Service, U.S. Treasury Department, 1960. Available from Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C., or from District Directors of Internal Revenue. 143 pages. 40 cents. This nontechnical reference book should help corporations, partnerships, and sole proprietorships to determine the tax results of their 1961 transactions. Making use of numerous examples, it offers detailed explanations of income taxes, excise taxes, social security taxes, and withholding taxes and covers still other tax problems relevant to conducting, starting, acquiring, or selling a business.

**THE SPLIT-LEVEL TRAP.** By Richard E. Gordon *et al.* Bernard Geis Associates, 1961. Available from Random House, 457 Madison Avenue, New York 22, N.Y. 348 pages. \$4.95. A popular report on the results of an intensive five-year study of the emotional problems characteristic of people who live in certain kinds of suburban communities. The authors explain the nature and sources of these tensions, illustrate their points with a number of case histories based on fact, though highly fictional in treatment. Some guidelines for prevention and treatment are offered.

**SIMULATION AND GAMING: A Symposium.** (AMA Management Report Number 55.) General Management Division, American Management Association, Inc., New York, N.Y., 1961. 135 pages. \$3.75 (AMA members, \$2.50). Addressed to both laymen and practitioners, this volume attempts to raise questions as well as to answer them. Its chief emphasis is on the use of gaming as a management training tool, and it includes papers on the use of simulation as a tool of behavioral research and of operations research.

**PHYSICAL DISTRIBUTION MANAGEMENT: The Logistics Problem of the Firm.** By Edward W. Smykay *et al.* The Macmillan Company, 60 Fifth Avenue, New York 11, N.Y., 1961. 283 pages. \$8.00. A guidebook for helping management analyze and improve its distribution systems. The

principles and methods used come from a number of fields—mathematics, statistics, transportation, marketing, and economics—but the book does not presuppose that the reader has an elaborate background in these. Among its practical features are check lists for selecting the most efficient, economical mode of transportation and the plant location that will best serve the company's needs; case studies illustrating the theoretical points; and detailed descriptions of methods of total cost analysis, location analysis, and sales forecasting and inventory control.

**ACCOUNTING SYSTEMS AND DATA PROCESSING.** By Oscar S. Nelson and Richard S. Woods. South-Western Publishing Company, 5101 Madison Road, Cincinnati 27, Ohio, 1961. 643 pages. \$8.00. After explaining the basic principles of developing, organizing, and using accounting data, this text discusses the analysis of accounting systems and the implementation of the analytical findings. In dealing with automation of data-processing, the final section leads the student from simpler punched-card systems to highly complex digital computer systems and, along the way, considers various management problems encountered in the development, design, and installation of these systems.

**PRODUCTION, FORECASTING, PLANNING, AND CONTROL.** Third Edition.) By E. H. Mac Niece. John Wiley & Sons, Inc., 440 Park Avenue South, New York 16, N. Y., 1961. 402 pages, \$9.75. This edition offers new chapters on sales forecasting, warehouse distribution, and control, as well as new material on economic lot sizes, electronic data processing, and military production planning and control. In addition, much of the theoretical and practical material of earlier editions has been rewritten for easier comprehension.

**MANAGING AMERICA'S ECONOMIC EXPLOSION.** Edited by Dan H. Fenn, Jr. McGraw-Hill Book Company, Inc., 330 West 42 Street, New York 36, N.Y., 1961. 269 pages. \$6.00. Speeches and discussions from the 1960 National Business Conference of the Harvard Business School Association. Such well-known figures as Stuart Symington, Frank Pace, Jr., and Walt W. Rostow expound their ideas on the broad question of economic growth, as well as on some specific management problems in an expanding economy—such as product-line planning, foreign marketing, and collective bargaining—and on such larger issues as economic growth and the welfare state, the entrepreneur and small business, and competition with Soviet research and development.

**THE CHALLENGE OF ABUNDANCE.** By Robert Theobald. Clarkson N. Potter, Inc., 56 East 66 Street, New York 21, N.Y., 1961. 235 pages. \$4.50. An economist examines the dangers and opportunities presented by our new economy of abundance and finds the chief danger in our persistent reliance upon economic and social ideas based on conditions of scarcity that are rapidly disappearing. He proposes drastic changes in our policies and practices on a broad range of issues—economic growth, the balance

between supply and demand, the relations between private and social goods and between government and business power, foreign economic and political relations, and others.

**PRINCIPLES OF INDUSTRIAL MANAGEMENT CASE BOOK.** By Raymond J. Ziegler. The Macmillan Company, 60 Fifth Avenue, New York 11, N.Y., 1961. 246 pages. \$3.50. Nearly 100 cases are distributed among ten major topics—first, the five basic functions of management (planning, organizing, and so on); then, its more specialized activities (production engineering, research and development, industrial relations, procurement, and production control). Included are cases illustrating such recent techniques and concepts as game theory, social agglomeration, and programming.

**ECONOMIC ISSUES OF THE 1960's.** By Alvin H. Hansen. McGraw-Hill Book Company, Inc., 330 West 42 Street, New York 36, N.Y., 1960. 244 pages. \$5.50. Writing chiefly for students and for the informed general reader, Professor Hansen addresses himself to three broad problems: inflation; growth, automation, and the dual economy; and developed and underdeveloped countries. His scholarly analysis and documentation are set in the framework of his own forthright convictions about the directions in which our country should be heading, and he offers a number of proposals that will undoubtedly prove controversial.

**MANAGEMENT IN THE SCIENTIFIC AGE: Proceedings of the 1958 Annual Conference of the Washington Chapter, Society for Advancement of Management.** The W. E. Upjohn Institute for Employment Research, 709 South Westnedge Avenue, Kalamazoo, Mich., 1961. 80 pages. Gratis. Speeches and discussions on the organization and management of research activities, the personal qualities required of managers in the scientific age, the goals and dynamics of scientific organization, and related topics.

## MARKETING

**TESTED ADVERTISING METHODS.** (Revised Edition.) By John Caples. Harper & Brothers, 49 East 33 Street, New York 16, N.Y., 1961. 308 pages. \$6.95. In this revised, enlarged edition, several chapters have been expanded and a number of illustrations added. Four new chapters deal with putting enthusiasm into advertising copy, 28 ways to get more inquiries from advertising, how to make small ads pay, and seventeen ways to test advertising.

**MARKETING OF AGRICULTURAL PRODUCTS.** (Second Edition.) By Richard L. Kohls. The Macmillan Company, 60 Fifth Avenue, New York 11, N.Y., 1961. 424 pages. \$7.50. Both the facts and the orientation of this introductory text have been brought up to date. As in the first edition, the material is approached in three ways—by institution, function, and commodity. The section on the institutional framework now gives more

prominence to processing, wholesaling, and retailing, and the section on functional problems includes two completely new chapters covering the issues involved in expanding the markets for food and in the changing organization of the marketing structure.

**AN ANALYTICAL APPROACH TO ADVERTISING EXPENDITURE STRATEGY.**

By Robert S. Weinberg. Association of National Advertisers, Inc., 155 East 44 Street, New York 17, N.Y., 1960. 127 pages. Nonmembers, \$5.00. An explanation of the uses and limitations of mathematical models in analyzing actual marketing and advertising situations. For the sake of readers with little or no technical background, it presents material in self-contained, step-by-step fashion. At the same time, it is comprehensive enough to enable research people to duplicate the scientific procedures it describes.

### FOREIGN OPERATIONS

**BUSINESS OPERATIONS IN FRANCE: A Guide for American Investors.** (1961 Edition.) Comité Franc-Dollar, 1001 Connecticut Avenue, N.W., Washington 6, D.C., 1961. 67 pages. \$2.50. The contents of the original, 1959 publication have been brought up to date: All rates and statistics have been recalculated into New Francs, and there is material on such recent developments as the Treaty of Friendship, Commerce, and Navigation of December, 1960, the changes in the French tax system, and additional incentives to investors.

**TAXATION AND OPERATIONS ABROAD.** Tax Institute, Inc., 457 Nassau Street, Princeton, N.J., 1960. 308 pages. \$6.00. Proceedings of a symposium conducted by the Tax Institute in 1959. The four groups of papers deal with tax and management decisions involved in choosing the form of a business organization for investments and operations abroad, selected economic problems, current issues of foreign taxes affecting U.S. management, and major problems of national policy.

**EUROPEAN GUIDE TO GENERAL COURSES IN BUSINESS MANAGEMENT.** European Productivity Agency. Organization for European Economic Co-operation, 1346 Connecticut Avenue, N.W., Washington 6, D. C., 1960. 644 pages. \$4.50. Based on a 1959 survey, this is a comprehensive index of over 150 general management courses conducted in the 16 O.E.E.C. member countries.

**TRAINING MANAGERS ABROAD.** By Jane Dustan and Barbara Makanzky. The Council for International Progress in Management (USA), Inc., 247 Park Avenue, New York 17, N.Y., 1960. 2 volumes, 588 pages. \$12.50. A research report on the 450 international management training and development programs that, according to the authors, represent the major efforts in the field today. The first part presents an overview of the work of each of the major groups involved—governmental organiza-

tions, companies and banks, management consultants, and educational institutions as well as associations, foundations, and institutes. The second part consists of detailed information about the activities of individual organizations in each of these categories (and some others), subdivided by country.

## Publications Received

*(Please order books directly from publishers)*

**ENCYCLOPEDIC DICTIONARY OF BUSINESS FINANCE.** By Prentice-Hall Editorial Staff. Prentice-Hall, Inc., Englewood Cliffs, N. J., 1961. 658 pages. \$19.50.

**READINGS IN COST ACCOUNTING, BUDGETING, AND CONTROL.** (Second Edition.) By William E. Thomas, Jr. South-Western Publishing Co., 5101 Madison Road, Cincinnati 27, Ohio, 1960. 833 pages. \$7.00.

**CAPITAL IN MANUFACTURING AND MINING: ITS FORMATION AND FINANCING.** By Daniel Creamer, Sergei P. Dobrovolsky, and Israel Borenstein. Princeton University Press, Princeton, N. J., 1960. 344 pages. \$7.50.

**POPULATION REDISTRIBUTION AND ECONOMIC GROWTH, UNITED STATES, 1870-1950 (Volume II.)** By Simon Kuznets, Ann Ratner Miller, and Richard A. Easterlin. The American Philosophical Society, 104 South Fifth Street, Philadelphia 6, Pa., 1960. 289 pages. \$5.00.

**THE GOALS OF ECONOMIC POLICY.** Economic Research Department, Chamber of Commerce of the United States, Washington 6, D. C., 1961. 35 pages. 50 cents.

**TRENDS IN GOVERNMENT FINANCING.** By Morris A. Copeland. Princeton University Press, Princeton, N. J., 1961. 210 pages. \$5.00.

**BUSINESS FORECASTING FOR THE 1960's: A SELECTED, ANNOTATED BIBLIOGRAPHY.** Compiled by Lorna M. Daniells. Baker Library, Graduate School of Business Administration, Harvard University, Soldiers Field, Boston 63, Mass., 1960. 41 pages. \$1.00.

**WAREHOUSE OPERATIONS PLANNING AND MANAGEMENT.** By Andrew J. Briggs. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y., 1960. \$8.50.

**THE ECONOMICS OF PUBLIC FINANCE.** (Third Edition.) By Philip E. Taylor. The Macmillan Company, 60 Fifth Avenue, New York 11, N. Y., 1961. 588 pages. \$7.50.

**ORGANIZATIONAL BEHAVIOR: CASES AND READINGS.** By John W. Hennessey, Jr. McGraw-Hill Book Company, Inc., 330 West 42 Street, New York 36, N. Y., 1960. 505 pages. \$7.95.

**ELECTRONIC COMPUTERS AND THEIR BUSINESS APPLICATIONS.** By A. J. Burton and R. G. Mills. Ernest Benn Limited, Bouverie House, London EC4, England, 1960. 325 pages. \$11.25.

**PRINCIPLES OF ACCOUNTING: ADVANCED.** (Fifth Edition.) By Harry A. Finney and Herbert E. Miller. Prentice-Hall Inc., Englewood Cliffs, N. J., 1960. 834 pages. \$11.35.

**PERSONAL DEDUCTIONS IN THE FEDERAL INCOME TAX.** By C. Harry Kahn. Princeton University Press, Princeton, N.J., 1960. 237 pages. \$5.00.

**A PROGRAM FOR FEDERAL TAX REVISION.** By Harvey E. Brazer. Institute of Public Administration, The University of Michigan, Ann Arbor, Mich., 1960. 50 pages. \$1.50.

**GERMANY BETWEEN EAST AND WEST: The Economics of Competitive Coexistence.** By Wolfgang F. Stolper. National Planning Association, 1606 New Hampshire Avenue, N.W., Washington 9, D.C., 1960. 80 pages. \$1.75.

**TOWARDS A FIRMER BASIS OF ECONOMIC POLICY: FORTY-FIRST ANNUAL REPORT.** National Bureau of Economic Research, Inc., 261 Madison Avenue, New York 16, N.Y., 1961. 85 pages. Single copies, gratis.

**1961-62 DIRECTORY OF FIRMS OPERATING IN FOREIGN COUNTRIES.** (Fourth Edition.) Compiled by Juvenal L. Angel. World Trade Academy Press, Inc., 50 East 42 Street, New York 17, N.Y., 1961. 201 pages. \$17.50.

**TRADE ASSOCIATION LAW AND PRACTICE.** By George P. Lamb and Sumner S. Kittelle, assisted by Carrington Shields. Little, Brown, & Company, 34 Beacon Street, Boston 6, Mass., 1956. 284 pages. \$10.00.

**THE MERGER ISSUE IN THE UNITED STATES.** Chamber of Commerce of the United States, 1615 H Street, N.W., Washington, D.C., 1961. 38 pages. Single copies, \$1.00.

**BUSINESS LAW.** (Sixth Edition.) By Ronald A. Anderson and Walter A. Kumpf. South-Western Publishing Company, Inc., 5101 Madison Road, Cincinnati 27, O., 1961. 948 pages. \$7.00.

**TRADE IN BUSINESS MACHINES: UNITED STATES, COMMON MARKET, AND OUTER SEVEN.** Prepared by the U.S. Department of Commerce. Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C., 1961. 16 pages. Single copies, 10 cents.

**INDUSTRIAL DEMANDS UPON THE MONEY MARKET, 1919-57: A Study in Fund-Flow Analysis.** By Wilson F. Payne. National Bureau of Economic Research, Inc., 261 Madison Avenue, New York 16, N.Y., 1961. 139 pages. \$1.50.

**THE RYUKYUAN MARKET.** Compiled and published by J. Walter Thompson Company, 420 Lexington Avenue, New York 17, N.Y., 1960. 42 pages. Single copies available free of charge to anyone who will write in on his company's letterhead.

**TWENTY-FIRST ANNUAL REPORT OF STOCKHOLDER ACTIVITIES AT CORPORATION MEETINGS DURING 1960.** By Lewis D. and John J. Gilbert, 1165 Park Avenue, New York 28, N.Y., 1961. 283 pages. \$2.00.

**PROGRESSIVE FILING.** (Seventh Edition.) By Gilbert Kahn, Theodore Yerian, and Jeffrey R. Stewart, Jr. Gregg Publishing Division, McGraw-Hill Book Company, Inc., 330 West 42 Street, New York 36, N.Y., 1961. 180 pages. \$3.16.

**MANAGEMENT OF INDUSTRIAL ENTERPRISES.** (Fourth Edition.) By Richard N. Owens. Richard D. Irwin, Inc., 1818 Ridge Road, Homewood, Ill., 1961. 724 pages. \$10.60.

**INSURANCE WORDS AND THEIR MEANINGS.** (Fifth Edition.) By Vincent L. Gallagher and Gerald R. Heath. The Rough Notes Company, Inc., 1142 North Meridian Street, Indianapolis 6, Ind., 1961. 111 pages. \$1.50.

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